NOFA Summer Conference

by Lydia Sivel-Irons

About 800 sustainably minded individuals converged in Amherst, MA on August 10-12 for a weekend of workshops, ideas and connection. On Friday the registration tent opened to sunny skies as folks arrived for their intensives, workshops and the keynote address by Rowen White. The ever-present rain storms that have dominated this growing season brought some festivities indoors, but the spirits of conference attendees were high.

The second year back to Hampshire College felt like we had never left as folks gathered on the main lawn to discuss the events of the day and what workshops to attend. The covered walkway into Franklin Patterson Hall, the main building where workshops were held, were lined with exhibitors who added as much knowledge to the event as they did wares.

Our attendees this year came from a multitude of backgrounds and lived experiences. The NOFA Summer Conference has always been a place where farmers of different ages and abilities come together to learn from one another and revel in their shared passion for a sustainable lifestyle. But this year more than ever our attendees represented the intersection of age, race, geography, class and interests that NOFA hopes to cultivate now and into the future.

Conference goers came not only for practical growing tips, but also to connect with one another. On Friday, Rowen White of Sierra Seeds led an intensive on seed saving. She spoke about how communities who have sovereignty over their seed supply can better support each other.

The feeling of NOFA being a touchpoint of community continued into Friday evening as the NOFA Person of the Year Award, Bill Duesing Award, and other dedications were made. The conference was dedicated to CT NOFA founder, Bill Duesing (August 19, 1942 - July 12, 2018) before our Friday keynote address. Bill served as the President of the NOFA Interstate Council for over 25 years and his positive qualities and impetus to benefit all living things permeated NOFA for four decades.

The NOFA person of the year was awarded to Mike Nadeau for his 30+ years in the organic landscaping business. He has grown to be one of the leading authorities in sustainable, organic, and ethical land care strategies in the US. He is also one of the primary professors for the NOFA Organic Land Care training program and helped develop the NOFA Standards for Organic Land Care.

We also presented Enid Wonnacott, NOFA-VT’s Executive Director, with the Bill Duesing NOFA lifetime achievement award. Enid’s kind and diligent care provided NOFA-VT with amazing leadership for more than three decades. Enid is a member of the NOFA Inter-

(continued on page A-9)
Hi Jack,

Congratulations on another fact-filled and informative issue. You did a great job of putting together material from before your time in NOFA. But I wanted to alert you to one rather grievous error in the photos...you erroneously identified a photo of Jack Cook "outstanding in his field" as Samuel Kayman! I did a Google images search, and sure enough, UMass archive also has it incorrectly identified. I just sent them a note, and had previously given them complete captions on all my photos, which seem to have been lost.

As for the rest of the issue, I do have to raise a couple of concerns:

One important organic ally goes unacknowledged. While there is a reference to the role played by OFPANA (the Organic Trade Association) in organizing the Organic Farmers Associations Caucus (OFAC) to lobby for passage of the OFPA, there is no mention of the ongoing role of OTA in advancing the organic agenda in Washington and in the scientific community, as well as in the marketplace.

NOFA was instrumental in the formation of OTA in 1985, yet today only NOFA-Vermont claims membership in the organization. I know that many NOFA members take issue with some of OTA’s positions and I certainly have had my own disagreements with them. Nevertheless, we don’t all have to agree on everything to form alliances to further common goals, and it serves no one for NOFA to refuse to engage with an important organic stakeholder.

I continue to be dismayed at the tone of enmity and sheer paranoia with regard to the National Organic Program expressed in policy statements made on NOFA’s behalf. Beyond unsubstantiated innuendo, the piece entitled “Attacks on Organic Integrity—Where Do We Go From Here?” repeats several items of misinformation about earlier drafts of the NOP as well as ill informed interpretations of current NOP policy.

Best regards -- Grace Gershuny, Barnet, VT

Hi Grace,

Wow, sorry about the photo error! I didn’t know Jack Cook (one of my predecessors as editor of this noble journal) and, as you say, the UMass archive where I got it had misidentified the photo. Thanks for the correction. I am publishing a photo of Samuel el and Gary Hirshberg here for those interested.

On your other points (sorry I had to trim them for space) I think OTA lost much of my respect when it supported congressional legislation to turn back the Arthur Harvey court victory on organic standards in 2003, and lost the rest for not standing firm against preemption of state GMO labeling laws in 2016. I do not see an ally there, more an opportunist. I will let Steve respond in the next issue on his article if he wants, but I do feel that many NOP supporters are very disappointed with it recently, witness the failure to promulgate the animal welfare rule and aggressively pushing through a divisive sunset definition.

Gratefully – Jack

Samuel Kayman and Gary Hirshberg in the old days

The Natural Farmer

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The Natural Farmer is a quarterly membership journal of the Northeast Organic Farming Assoc. You may join NOFA through one of the seven state chapters linked at www.nofa.org. We plan a year in advance so those who want to write on a topic can have a lot of lead time. The next 3 issues we are planning are: Winter 2018-9; Alternative Certification Programs Spring 2019; Food Sovereignty Summer 2018; Seed Breeding If you can help us on any of these topics, or have ideas for new ones, please get in touch. We need your help! The deadline for the issues are: Spring - January 31, Summer - April 30, Fall - July 31, Winter - October 31. Advertisers and Sponsors see rate and deadline information at www.thenaturalfarmer.org. Click the menu bar under “Advertising”

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In Memory of William Norton Duesing, 1942 to 2018

William Norton Duesing, known to all as Bill, died at 75 on July 12, 2018 at the Connecticut Hospice in Branford, Connecticut. Bill was born on August 19, 1942 in Detroit, Michigan and was predeceased by his parents, Howard Ernest Duesing and Charlotte Morehouse Duesing.

Bill is survived by his wife, Suzanne Mann Skorpen Duesing and his children: Daniel Ethan Duesing and his wife, Kassie Murphy of Simsbury, Connecticut; and John Duesing and his wife Pam Clark of West Des Moines, Iowa.

Bill was most at home outdoors in the natural environment. He enjoyed spending time on the Old Solar Farm in his gardens, walking in the woods, and tent camping throughout his life. After graduating from Yale College with a B.A. in Fine Arts, he briefly attended the Yale School of Architecture. As a member of the artists’ group Pulsia, he created large-scale environmental art between 1967 and 1972 in museums and public spaces in New York, Boston, Minneapolis, Los Angeles, Philadelphia and Halifax. Documents from that work were displayed recently at the Brooklyn Museum of Art. His art work with Pulsia is archived at: https://archive.org/search.php?query=pulsia+group. He also created environmental art installations in Lincoln Center, Central Park, and the New Haven Green during the 1970s and 1980s. Bill continued his interest in architecture by teaching solar design at Paier College of Art and the Milden Institute.

For 45 years, as an organic farmer, author, artist and environmental activist, Bill promoted organic agriculture, solar energy, and greater local food sufficiency in Connecticut and the Northeast through lectures, writings, media and community work. With his wife, Suzanne, he grew vegetables, fruits and flowers on their farm, while tirelessly advocating for a local and organic food system.

Bill Duesing
Bill was the founding president of Northeast Organic Farming Association of Connecticut (CT NOFA) in 1982 and served for 12 years as the Executive Director. For many years, Bill served on the NOFA Interstate Council, including a decade as President. The Council awarded Bill the first “Bill Duesing Lifetime Achievement Award” at its 2015 Summer Conference. In his later years, he worked as the CT NOFA Organic Advocate, and as a consultant, mentoring new farmers. Bill shared personal reflections on his nearly four decades of involvement in the organic food movement with CT NOFA in his report about the 41st NOFA Summer Conference, which is available at: http://cnofa1982.blogspot.com.

For three years, Bill chaired the board of the Community Farm of Simsbury, which trains farmers, educates urban and suburban students, and provides certified organic food to the needy. He was especially proud of his work with Once Upon a Farm in Bethany, Connecticut where he was recently honored by having his name grace the Learning and Education Center there. Bill was awarded the Bronze Medal by the Federated Garden Clubs of Connecticut in 2010 and received a Lifetime Achievement Award from PACE (People’s Action for Clean Energy) in 2014. He was a founding board member and past president of the Connecticut Farmland Trust. He also served on the steering committee of the Connecticut Working Lands Alliance. Bill is the author of Living on the Earth: Eclectic Essays for a Sustainable and Joyful Future. These essays, written decades ago, are still relevant today.

Bill’s passion for educating youth was evident in his work as founding chair of the New Haven Ecol- ogy project and the establishment of one of the first charter schools in the state. The Common Ground High School continues to successfully educate young people on its farm located in New Haven. In addition, Bill gardened for years with Suzanne and her elementary students in Bridgeport.

For 10 years, Bill wrote and delivered a weekly environmental essay on public radio from Fairfield, CT. Until recently, he could be heard every other week on WPKN radio on the Organic Farm Stand with Guy Beardsley and Richard Hill. Richard has created a legacy piece on Bill’s life which is now available as a podcast on WPKN. The University of Massachusetts library has archived five years of his weekly “Living on the Earth” radio essays and recordings of 14 “Politics of Food” radio shows on this page: http://scua.library.umass.edu/digital/duesing.

A memorial to celebrate Bill’s amazing life will be held at the Common Ground High School in New Haven on September 8, 2018 at 4 pm.

Those who wish to continue Bill’s life’s work can join his many friends and CT NOFA to carry on his legacy. Each year at CT NOFA’s Winter Conference, “The Bill Duesing Organic Living On The Earth Award” will be given to a deserving farmer, organic landscaper, advocate or an organization that demonstrates devotion to Bill’s goals of loving and treating the earth respectfully. If you are inspired by his dedication, his grace and his strength, you can support this award by donating in his honor to Bill Duesing Fund at CT NOFA: The Northeast Organic Farming Association of Connecticut at: bit.ly/bill-duesingfund.

Please help us thank these Friends of Organic Farming for their generous support!

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Sustainable Farming Leaders Strategize for Healthy Soils Across the Nation

by Lauren Lum

Over the course of two sunny days in Seattle, 14 sustainable agriculture organizations convened a strategy meeting to advance healthy soil legislation. We gathered as farmers, farmer-based organizations and advocates working in more than 20 states and nationwide to explore pathways at the forefront of healthy soils advocacy.

The meeting was the culmination of more than eight months of webinars and resource sharing building upon a burgeoning interest nationwide in the potential of agricultural soil health to mitigate climate change, enhance on-farm resilience to extreme weather and drought, and improve water and air quality.

The organizations present listed at the end share a common understanding of the climate volatility threatening America’s farms such as flooding, drought and fires. We also understand the powerful solutions farmers and ranchers have to offer to address environmental problems, especially when equipped with sufficient resources to adopt practices that increase organic matter and the biological health of the soil, enhance water quality and water retention rates, and sequester carbon. To that end, we recognize the importance of using farmer-informed policy to scale up these solutions, leveraging robust funding and incentives, technical assistance and research to accelerate the widespread adoption of soil stewardship practices.

There were several objectives for our meeting: to become more familiar with the work of our organizations; to compare and contrast existing and emerging models of legislation and policies that incentivize healthy soils practices; to share grassroots organizing and campaign strategy experiences and lessons.

We familiarized ourselves with several creative state and federal policy tools that could incentivize healthy soils practices including:

- Cap-and-trade programs (such as those existing in CA, the northeast and proposed in OR and WA)
- Bond measures
- Creation of state healthy soils programs
- Impact fees on fertilizers and water quality contaminants
- Reform of various federal farm bill programs (e.g., crop insurance, Conservation Stewardship Program) to expand use of healthy soils management practices
- Water quality mitigation programs
- Funding healthy soils as a disaster preparedness tool for flooding and drought

We discovered the value in discussing challenges faced by farmers struggling to stay in business while facing natural resources limits, climate change impacts and a host of other difficult trends in the agriculture sector. Though our work takes place within many different contexts spanning the entire country, common themes emerged. We all work with and on behalf of some of the country’s most innovative farmers and ranchers leading the way on techniques that are both economically advantageous to producers and ecologically beneficial. We all appreciate the importance of pursuing policies that deliver funding and technical resources that support transitions to ecological and regenerative agriculture practices. And we know that it is imperative to form coalitions that put farmer leaders at the center while also building relationships with other politically influential partners in sectors such as conservation, environmental justice, health and others.

The group left inspired by one another and with a desire to stay connected, to continue sharing resources, to research and strategize at the regional level on specific legislative ideas, and to expand our conversation to include other experts and potential allies.
Monsanto ordered to pay $289m for Roundup-cased cancer

Monsanto suffered a major blow with a jury ruling that the company was liable for a terminally ill man’s cancer, awarding him $289m in damages. Dr. Wayne Johnson, a 46-year-old former groundskeeper, won a $289 million judgment from Monsanto on August 10, with a San Francisco jury determining that the company’s Roundup weedkiller caused his cancer and that the corporation failed to warn him of the health hazards from exposure. The jury further found that Monsanto “acted with malice or oppression”. Johnson’s lawyers argued over the course of a month-long trial in San Francisco that Monsanto had “fought science” for years and targeted academics who spoke up about possible health risks of the herbicide product. Johnstown was the first person to take the agrochemical corporation to trial over allegations that the chemical sold under the brand Roundup causes cancer.

In the extraordinary verdict, which Monsanto said it intends to appeal, the jury ruled that the company was responsible for “negligent failure” and knew or should have known that its product was “dangerous”.

“We were finally able to show the jury the secret, internal Monsanto documents proving that Monsanto has known for decades that ... Roundup could cause cancer,” Johnson’s lawyer Brent Wisner said in a statement. The verdict, he added, sent the signal that the company’s Roundup weedkiller caused his cancer and that they should put consumer safety first over profits.

Speaking in San Francisco, Johnson said that the jury’s verdict is far bigger than his lawsuit. He said he hopes the case brings national attention to the issue. Johnson was the first person to take the agrochemical corporation to trial over allegations that the chemical sold under the brand Roundup causes cancer.

Fertilizing crops may make them more susceptible to disease.

University of California, Berkeley, biologists found that spraying tomatoes with microbes from healthy tomatoes protected them from disease-causing bacteria, but that fertilizing the plants beforehand negated the protection, leading to an increase in the population of pathogenic microbes on the plants’ leaves.

“When we change the nutrient environment that plants are in, we are fundamentally altering the plant-microbiome interaction and also, importantly, the microbiome-mediated protection of natural plant/microbe interactions,” said senior author Brett Koskella, a UC Berkeley assistant professor of integrative biology.

The fertilizer effect was not the only surprise from the study, Koskella said. She and co-author Maureen Berg, a graduate student, were investigating how the density of the microbial community on the leaves affected the plant’s resistance to disease and discovered that a lower dose of beneficial microbes sprayed on the leaves was often more effective in protecting the plants from infection than higher doses. Berg sprayed leaves with an artificial microbial community composed of 12 species of bacteria taken from the natural microbiome of healthy tomatoes.

“We found that the most protective community was the most dilute, the least concentrated, the lowest dose,” she said. “This was completely nonintuitive. A medium dose gave medium protection and the highest dose was the least protective.”

The reasons are unclear, but the findings are important because organic farmers are talking about spraying crops with probiotics to encourage better growth and disease protection, in the same way that humans consume probiotics containing ‘good’ microbes in hopes of improving their health.


Is Your Risk Management Plan Up to Date?

USDA Allows Crops Sprayed with Synthetic Pesticides to be Sold as Organic

The USDA has allowed pesticides to be sprayed on crops in Texas under emergency provisions and has stated that the crops that have been sprayed can continue to be sold as organic.

According to the organic regulations, in emergency circumstances the use of synthetic pesticides can be sprayed without a farm losing its certification, but according to the regulations, crops that have been sprayed SHOULD NOT BE SOLD as organic.

On September 11, 2017, several certifiers in affected areas were sent a letter about Hurricane Harvey Mosquito Treatment allowing the insecticide Naled in Texas. This was published on the USDA website but not included on the list of Temporary Variances. On September 15, 2017, a second letter was sent adding the insecticide Dust to the allowed list, and on July 20, 2018, a third letter was sent to certifiers affirming this decision.

None of the three letters to certifiers in Texas have been published on the USDA website and they have not been included on the lists of Temporary Variances. Although these letters were written in response to the types of natural disasters and damage that the regulations allow for the issuance of Temporary Variances, the letters do not follow the procedures or restrictions required in §205.290 Temporary Variances. The letters do refer to the section of the regulations that apply to Federal and State Emergency pest or disease treatment, but they waive the prohibition on organic sales of treated crops in §205.072(a).

source: Beyond Pesticides letter, July 26, 2018

Nature’s Path Joins Dr. Bronner’s in Quitting OTA

Nature’s Path Foods Inc., North America’s largest organic cereal company, has quit the Organic Trade Association (OTA) in protest, citing concern that the trade group is “pushing a non-organic agenda which threatens the future of organic.”

The company said the decision to renounce its OTA membership is based on two recent actions by the trade group. The first was OTA allegedly “misrepresenting organic food companies and U.S. consumers” to support what Nature’s Path calls “a vague and misleading national GMO labeling law.”

Laura Batcha, OTA executive director, said in a statement that Nature’s Path’s allegations were “simply not true” and that the OTA’s “only agenda is organic.”

In a message to OTA members about a month before the legislation became law, Laura Batcha, OTA executive director, and Melissa Hughes, OTA board president, said the provision to allow organic food producers to display a “non-GMO” label in addition to the organic seal means “at least we know organic will be protected in the process.”

Nature’s Path also took issue with the OTA...
allegedly “allowing hydroponics to fall under the organic umbrella label while there is no organic agriculture nor soil present.” In November, the National Organic Standards Board (NOSB), the 15-member panel of experts recommending organic policy to the USDA’s National Organic Program (NOP), voted 8 to 7 to continue to allow hydroponics, aquaculture, and container systems in organic production.

Nature’s Path’s exit from OTA echoes the 2016 withdrawal of All-One-God-Faith, Inc. dba Dr. Bronner’s, North America’s top-selling natural brand of soap and organic body care products, from the OTA. Dr. Bronner’s had cited the trade group’s alleged “general drift away from the core principles that drive the organic movement.”

source: Sustainable Food News, July 2, 2018

Organically Grown Co. Sold to a “Purpose Trust”

The Organically Grown Company (OGC) is the largest organic produce distributor in the Pacific Northwest and moves more than 100 million pounds of produce a year. It was owned by its 230 employees and about 50 founding farmers, but has now been sold to a “purpose trust,” set up to maximize ownership to all its workers in addition to the company’s sustainability mission. OGC was started as a cooperative in the late 1970s by a group of farmers who thought they could do better if instead of competing with one another they worked together. In 2008, the company converted to an employee stock ownership plan (ESOP), giving ownership to all its workers in addition to the original farmers. The problem was that as its owners retired, the company had to buy them out, and with interest in the organic sector growing among venture capital investors, OGC’s valuation kept rising.

“We didn’t see any end to it, so we had to come up with another structure,” OGC vice-president Natalie Reitman-White said. What OGC settled on was a Sustainable Food and Agriculture Perpetual Purpose Trust, which is designed to last forever. Members of this committee include employees, farmers, customers, and allies such as nonprofit advocates.

source: FERN Ag Insider, July 5, 2018

FDA: Golden Rice Offers No Nutritional Benefits

Golden Rice refers to GMO rice plants modified to produce beta-carotene in their grain. The biotech industry and its supporters have promoted GMO Golden Rice for decades as an urgently needed solution to vitamin A deficiency. But, in a surprising twist, the US Food and Drug Administration (FDA) has concluded its consultation process on Golden Rice by informing its current developers, the International Rice Research Institute (IRRI), that Golden Rice does not meet the nutritional requirements to make a health claim.

FDA notes the mean value of beta-carotene for GR2E is 1.26ug/g. This is, paradoxically, less beta-carotene than the 1.6ug/g measured for the original iteration of Golden Rice. Greenpeace once calculated that such low levels would necessitate a person to eat 3.75 kg of Golden Rice per day to receive an adequate amount of beta-carotene.

In the same memo, FDA also states, “IRRI acknowledged that it expects the actual dietary intakes to be lower given that beta-carotene levels in food containing GR2E rice would decline over time due to storage…”

Unnoticed by the media, a 2017 paper published in the Journal of Agricultural and Food Chemistry reported that the beta-carotene content of Golden Rice GR2E at harvest is short-lived. This study found Golden Rice retained only 60% of its original beta-carotene levels after 3 weeks of storage and just 13% after 10 weeks. The apparent explanation is that the beta-carotene in Golden Rice is unstable in the presence of oxygen. Thus, under normal storage conditions, the beta-carotene in Golden Rice would readily degrade. Under tropical farming, storage, and household conditions, degradation may be faster still.

source: Independent Science News, June 4, 2018

Whole Foods Quietly Pauses its GMO Labeling Requirements

In an email to suppliers in May, Whole Foods President and Chief Operations Officer A.C. Gallo announced the company would pause its genetically modified (GMO) food labeling requirements, which were scheduled to take full effect on September 1. The rules, first announced five years ago, require that suppliers disclose the presence of genetically modified ingredients on all packaging.

Gallo says that the pause is a response to suppliers’ concerns about having to comply with two competing sets of rules: Whole Foods’ own GMO labeling requirements, and rules newly proposed by the United States Department of Agriculture (USDA).

As currently written, Whole Foods’ requirements would be more stringent than the proposed USDA rules in at least two significant ways. First, USDA has suggested letting companies label ingredients by QR code, meaning that customers would need to be directed to a website via smartphone to find out what’s in their food—a method that has been criticized as a cumbersome extra step. Whole Foods has never planned to allow QR codes to count as GMO disclosures. Second, USDA rules contain perplexing carve outs for meat products, which are regulated under a different system.

Whole Foods now faces a choice: It can move forward with its original plan, or defer to the government’s less comprehensive new rules. The company has the ability to be clearer and more stringent than the federal regulations, requiring all foods that might contain genetically modified ingredients to say as much. Deferring to USDA rules would, instead, require only that some GMO-containing products are labeled as such—likely a sore point for non-GMO advocates, and not necessarily great for the Whole Foods brand. It would mean that a company that’s long claimed the moral high ground would be no more transparent, as far as GMO labeling goes, than any other grocery store.

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Whole Foods Quietly Pauses its GMO Labeling Requirements

source: FERN Ag Insider, July 5, 2018

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When the company first announced its labeling policy in 2013, it marked the first time a national grocery chain made a commitment to GMO transparency. “We are putting a stake in the ground on GMO labeling to support the consumer’s right to know,” co-CEO Walter Robb said in a press release.

A lot has happened since then. The federal government passed its GMO labeling law in the summer of 2016; a year later, Whole Foods was acquired by e-commerce giant Amazon.

source: New Food Economy, May 21st, 2018

Virus resistance breaks down in Chinese GM papaya

Ring spot virus-resistant GM papayas are often cited as a genetic engineering success. But a new study (Wu, Z., Mo, C., Zhang, S., & Li, H. (2018) in Scientific Reports, 8(1), 8206) reports that in China the virus resistance in GM papaya has broken down under pressure from a new lineage of the virus. The study reports that the GM virus-resistant papaya planted in Hawaii retains its virus resistance, but this has not saved the Hawaiian papaya industry, since many countries don’t want GM papaya and up to a third of the crop is thrown away because it’s bruised or mis-shaped. As a result, USDA scientists have been looking at ways to make the unwieldy GM papayas into biofuel. In addition, a non-GM virus-resistant papaya has been developed, suggesting that the GM version is not needed.


Researchers from UC Davis, the University of Wisconsin–Madison, and Mars, Incorporated have made a remarkable discovery: an indigenous variety of Mexican corn that can also fix nitrogen from the atmosphere. The team’s findings were published Aug. 7 in the journal PLOS Biology.

Corn was a wild plant domesticated in Mexico about 10,000 years ago. It can grow more than 16-feet-tall, towering over the typical 12-foot-tall conventional varieties. It also grows slowly, taking eight to nine months rather than the three months of conventional corn. The study found the Sierra Mixe corn obtains 28 to 82 percent of its nitrogen from the atmosphere. To do this, the corn grows a series of aerial roots. Unlike conventional corn, which has one or two groups of aerial roots near its base, the nitrogen-fixing corn develops eight to ten thick aerial roots that never touch the ground.

During certain times of the year, these roots secrete a gel-like substance, or mucilage. The mucilage provides the low-oxygen and sugar-rich environment required to attract bacteria that can transform nitrogen from the air into a form the corn can use. “Our research has demonstrated that the mucilage found in this Sierra Mixe corn forms a key component of its nitrogen fixation,” said co-author Jean-Michel Ané, professor of agronomy and bacteriology in the College of Agricultural and Life Sciences at UW–Madison. “We have shown this through growth of the plant both in Mexico and Wisconsin.”

Cross-breeding this corn with conventional varieties could reduce the need for added fertilizer and increase yields in regions with poor soil, researchers believe. They are a long way from developing a similar nitrogen-fixing trait for commercial corn, but this is a first step to guide further research on that application. The discovery could lead to a reduction of fertilizer use for corn, one of the world’s major cereal crops. It takes 1 to 2 percent of the total global energy supply to produce fertilizer. The energy-intensive process is also responsible for 1 to 2 percent of global greenhouse gas emissions. “Corn yields in developing countries are one-tenth of those found in the U.S., due both to variety development and access to affordable nitrogen fertilizer,” said co-author Allen Van Deynze, director of research at the UC Davis Seed Biotechnology Center. “This discovery opens the door to significantly impro-

Tropical nitrogen-fixing corn discovered in the Sierra Mixe region of Mexico looks nothing like conventional corn. (Jean-Michel Ane/UC Davis)

U.S. Appeals Court Orders EPA to Ban Pesticide Chlorpyrifos, Said to Harm Children

In a 2-1 decision the 9th U.S. Circuit Court of Appeals in Seattle ordered the U.S. Environmental Protection Agency to ban chlorpyrifos, a widely-used pesticide that critics say can harm children and farmers.

“This shows that the EPA can’t just ignore the science that this pesticide damages children’s brains,” Marisa Ordonia, a lawyer for Earthjustice, which represented the petitioners, said in an interview. “The Trump administration has to follow the law, as does everyone else.”

Writing for the appeals court, Judge Jed Rakoff directed the EPA to ban chlorpyrifos within 60 days, saying the agency failed to counteract “scientific evidence that its residue on food causes neurodevelopmental damage to children.”

Rakoff also faulted the EPA for going against its own 2016 risk assessment for the pesti-

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source: August 7, 2018, Food and Agriculture

source: August 9, 2018, Reuters

Cornucopia scores organic dairies

The Cornucopia Institute, a nonprofit organic watchdog organization, has issued a scorecard at https://www.cornucopia.org/scorecard/dairy/ for organic dairy operations across the country based on a 19-question survey, unannounced site inspections, aerial photography, satellite imagery, an analysis of regulatory documents and industry interviews. Cornucopia deemed the top-rated farms as those that are small-to-medium-size family businesses that emphasize pasture management, grow most of their own feed and raise their own replacement cows from the young animals born on the farm.

source: Cornucopia press release, August 13, 2018

source: New Food Economy, May 21st, 2018
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state Council and served as its co-president for many years. Enid embodies everything that the organic movement stands for.

Then after a heartfelt participatory song led by Julie Rawson, the Executive Director of NOFA/Mass, and Enid, Rowen White was introduced and took the stage. She began her keynote with a photo of sacred red corn on the projector and a dried cob on the podium with her. Rowen asked the audience to “put our hearts and minds together” as we listened to her heartfelt address on the rematriation of seeds.

Jeff Cordulack from CTNOFA was honored to again host the Northeast Assembly of the U.S. Food Sovereignty Alliance before our Summer Conference at Hampshire College. The concept of food sovereignty and the movement surrounding it provide many important insights for the broader food and agriculture movements, and will be explored in an upcoming edition of The Natural Farmer.

NOFA asked White what role NOFA can play in furthering the work she and others are doing. “It starts with acknowledging that there are still Native people who live in the Northeast,” White shared. “Not a lot of people recognize that, you know... I know many of our elders have made it to the NOFA-NY conferences and have been offered esteemed places to speak on this work, as well as I have. As Saturday dawned even more farmers of many different backgrounds and lived experience arrived and brought with them energy and a spring in their step as they headed off to the workshops that spoke to them.

A capacity crowd gathered on Saturday afternoon as Eric Holt-Giménez discussed the repercussions of industrial ag on the environment, our lives, and our public sphere. He finds commonality between small-scale, family farmers in the Global North and the Global South. He called for a new agrarian transition - a people’s and organic agrarian transition. “Agroecology, small-scale, locally based food systems could draw the world out of poverty and end hunger and reduce environmental destruction. The food system is not broken, it’s dysfunctional. It works for the rich, for you guys not so much. It’s working exactly as it’s designed. We have to build something new... based on completely different principles.”

After dinner on Saturday our esteemed guests Francis Thicke, Lisa Stokke, Eliot Coleman and Elizabeth Henderson engaged in a productive conversation addressing the question “Where Do We Go From Here?” with organic labeling. The topic was heavy but the discussion was light and informative with 150 engaged participants present to explore how we can move forward as a movement.

With the heartfelt connection that comes with spending a weekend together learning how to become better farmers and how to make farming practices better for the global community, by Sunday the air was full of comradery. Newcomers and old timers alike were primed to tuck into this year’s more advanced workshops on animal husbandry. Laura Hayes of Bethel, CT, a beginning farmer new to the Summer Conference, was taking as many workshops on grazing and animal husbandry as she could to help her better expand her small farm with pigs and include a dairy as well.

This year NOFA collaborated with a wide variety of organizations, farms, communities, etc to bring attendees from all over the region, including US Food Sovereignty Alliance, Pioneer Valley Grows, Grow Food Northampton, Just Roots, Pioneer Valley Workers Center, Neighboring Food Coop Association, National Young Farmers Association, Bio-nutrient Food Association, New Entry Sustainable Farming Project, Acres, Gardening the Community, Northeast Prison Garden Educators Collaborative, and the Agricultural Action Network.

We welcome partnerships, suggestions and ideas as we plan the 45th Summer Conference, taking place August 9-11, 2019. A call for workshop proposals opened September 1st. Visit www.nofasummerconference.org for more information.
The next part of the book is devoted to showing how fungi (mushrooms, yeasts, molds, and mycelia) can degrade and remediate metals, chemicals and microbes.

Metals – 53 of the 118 elements on the periodic table are considered heavy metals, many of which have toxic effects on human health and the environment. These metals cannot be reduced to something simpler, but they can be remediated in any of four ways.

- Mycorrhizal fungi actively degrade trees, including cellulose and lignen, and many mammamde highly toxic materials such as Polychlorinated Biphenyls (PCBs), DDT, Volatile Organic Compounds (VOCs), and Polycyclic Aromatic Hydrocarbons (PAHs). Many complex chemicals are degraded to their constituent elemental ingredients, leaving harmless residues.

Microbes – Many common pathogens (bacteria, viruses, protozoans) are harmless, but a few cause food poisoning or deadly infections. Fungi are able to attack and kill many such pathogens (penicillin was one fungal product that started the whole industry of fungal antibiotics).

Much of the book is composed of lists of metals, chemicals, and microbes and which fungi can remediate them. These are listed both by pollutant and by fungi, for ease of finding by the reader.

Dorr discusses the practical details of mycoremediation projects, including needed bench scale tests before starting the whole project, and on-site pilot tests to find the practical realities you will encounter before undertaking the actual work.

The key to fungal usefulness in remediation is their ability to secrete enzymes. Some 4000 are recognized and a total of at least 25,000 are speculated to exist. Various ways to extract enzymes are provided, and a list of some 3 dozen types is given along with the species that produce them and their common uses.

A section on water – fresh and salt – pollution and remediation is interesting. One project which caught my interest was dealing with the amazing amount of floating plastic trash in our oceans. Dorr reports a plan to collect that trash (there are natural spots where ocean currents bring much of it together), expose it to ultraviolet light, and then degrade it with fungal enzymes.

The endophytic fungus Pestalotiopsis microspora, which can use polyurethane plastic as a primary food source either in the presence or absence of oxygen, is proposed as a way to manage our toxic landfills.

Of course any type of remediation is potentially dangerous as it deals with deadly substances and powerful enzymes, and Dorr cautions the reader about such dangers. A number of practical plans to help the amateur get started cultivating fungi seemed well thought-out. Inoculating cardboard and various substrates to get easy cultures, making a

**Book Reviews**


The purpose of this book, Alex says in the foreword, is to inspire people to use natural organisms to clean up human waste of all sorts. Fungi are particularly well adapted to this task of decomposition, he asserts, and this book is to serve as a guide to how to use them for this function.

He starts off making sure we are aware of the vastness of the problem of waste. Hazardous wastes, those that can cause “substantial threats to our health and the environment” are produced at the rate of 400 million tons per year. That comes, he says, to about 13 tons per second! These come from common products like batteries, cosmetics, cleaning products, paints, pharmaceuticals, and electronics. The US has 200,000 “superfund sites” that are unusually high in hazardous waste, whose cleanup will cost an estimated $1.7 trillion over the next 30 years. The scale and expense of this problem and its current technological solution make it daunting. One of the major techniques now used in such clean-ups is bioremediation with bacteria and plants. Dorr asserts, however, that mycoremediation can serve this role far more successfully and economically. He displays a graph from Paul Stamets’s book “Mycelium Running” which seems to demonstrate this advantage.

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- Mycosorption uses the fungal mycelium to bind up the heavy metals via an ion exchange mechanism and concentrate them in its polysaccharide cell wall, later to be chelated and reclaimed. This is particularly useful when the metal is contaminating waterways.

- Solubilization makes metals more soluble or immobile by producing organic acids and other compounds which form complexes with the metals. Solubilization is best practiced using mycorrhizal fungi in combination with plants on contaminated soil.

- Translocation accumulates metals into mycelial networks where they are channeled into fruiting bodies, nature’s way of eliminating them from the soil.

- Mycoaccumulation is similar to translocation, allowing accumulation of the metal into a mycellial network. Various ways of disposing of the accumulated metals are then brought into play.

**Chemicals** – Fungal ability to produce powerful enzymes is well known. Brown, White, and Soft rot fungi actively degrade trees, including cellulose and lignen, and many mammamde highly toxic materials such as Polychlorinated Biphenyls (PCBs), DDT, Volatile Organic Compounds (VOCs), and Polycyclic Aromatic Hydrocarbons (PAHs). Mycoremediation projects, including needed bench scale tests before starting the whole project, and on-site pilot tests to find the practical realities you will encounter before undertaking the actual work.

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**Day and Night, 1938, by M. C. Escher**

“The farmer has put plants and animals into a relationship of mutual dependence…that involves solutions to problems of fertility, soil husbandry, economics, sanitation – a whole complex of problems whose proper solutions add up to health: the health of the soil, of plants and animals, of farm and farmers, of farm family and farm community, all involved in the same inter-nested, interlocking pattern…”

Nice connection, Woody!

I also liked the Happy Planet Index Tasch cites, introduced in 2006 by the New Economics Foundation. Its calculations are only four:

1. **Wellbeing**: How satisfied the residents of each country say they feel with life overall, on a scale from 0 to 10, based on data collected as part of the Gallup World Poll.

2. **Economic performance**: Measured by the rate of GDP growth.

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Nice connection, Woody!
The first three are multiplied, and then divided by the fourth, as shown in the above equation illustration.

In the last part of this book Woody gets directly to the crux of his message, slow money investing. He details individuals who are doing worthwhile things and have created economic ventures (Anne and Jack Lazor of Vermont’s Butterworks Yogurt are featured, for instance). Ways to invest “Nurture Capital” are encouraged, something that Tasch suggests may be simply a more feminine approach to investing, taking into account the whole, including justice and fairness, and being content with small solutions.

As someone who has tried to do exactly this with very limited resources – Julie and I have lent small amounts over the years to a seed coop, an organic food processing start-up, and a local young dairy farm family – I can testify to the satisfactions of such an approach.

That is what Woody is talking about.

I should close with one of my favorite of his bon mots: “We are all earthworms. The modern economy is a plow.”

The Ever Curious Gardener: Using a Little Natural Science for a Much Better Garden

by Lee Reich


206 pages, paperback format, $18.99

review by Jack Kittredge
Dirt to Soil: One Family’s Journey into Regenerative Agriculture
by Gabe Brown with Courtney White
240 pages, paperback format, $19.95
review by Jack Kittredge

As many readers of The Natural Farmer know, Gabe Brown is the conventional North Dakota diversified farmer who learned the hard way how to transform a degraded, failing farm into a healthy, profitable one using the power of nature. This book is the “tell all” story of his journey.

Gabe learned farming by working eight years with his father-in-law on a 1760 acre grain and beef ranch which was heavily tilled and herbicided, with the cattle subject to multiple vaccinations and pour-on insecticides. By the time Gabe and his wife Shelly purchased the home farm, Gabe was seriously concerned about these practices and particularly the condition of the soil. Their organic matter ranged from 1.7 to 1.9 percent, in an area of the upper Great Plains that had once boasted 7 to 8 percent. Water infiltrated at the rate of half an inch per hour, not fast enough to retain much of the only 16 inches of precipitation that fell there each year.

For the first few years after taking over the farm, not knowing what else he could do, Gabe continued the tillage, fertilizers and herbicides his in-laws had used. But then a farming friend suggested that no-till was saving him time and moisture and that Gabe should try it. But he cautioned Gabe: “If you do go no-till, sell all of your tillage equipment so you are not tempted to go back.”

Gabe couldn’t afford a no-till drill without doing that so he sold all his tillage stuff and bought the drill. The first year of no-till was fantastic, Gabe recalls. Not only did yields go up, but he was able to reduce nitrogen fertilizer costs by adding field peas to the crop rotation. The next year Brown’s spring wheat crop was devastated by a hail storm. The calves were unharmed, but with an operating loan and a mortgage, finances were very tight. Two years later another hail storm and a major medical diagnosis for their daughter forced both Gabe and Shelly to take off-farm jobs.

The “disaster years” continued for the Browns a couple more years, but like Job, he persevered and never lost faith. He kept learning, deciding to adopt a Savory grazing system, moving the cows to a winter foraging system because he couldn’t afford the twine to bale his hay, and suddenly noticed a large number of earthworms in the soil where previously he couldn’t find any. He knew he was on the right track. In the 20 years since the disasters Gabe has become a major spokesperson for what he calls regenerative agriculture.

More than half the book is devoted to the Brown Ranch story, disasters, changes, and all. The rest talks about applying what Gabe has learned to other situations. He in convinced that these lessons will work anywhere because they are the way nature works.

The five principles of soil health, according to Brown, are:
• limit disturbance – mechanical, chemical, physical
• armor – keep soil covered at all times
• diversity – strive for a diverse mix of plants, animals, and microbes
• living roots – keep plants alive in the soil as long as possible throughout the year
• integrate animals – they are necessary for a healthy, natural ecosystem

There is far more information in this book than I can describe, but I think any farmer will find it fascinating. Toward the end of the book Gabe discusses other farms which are also adopting regenerative agriculture – in Australia, Kansas, North Carolina, Alberta, Texas, Saskatchewan, and Montana – and succeeding. There is no simple formula, and these folks are also looking to creative marketing and diverse products to protect against downturns. But the key, he repeats, is first seeing the power of nature and understanding the farmer has to learn how to work with it.

by Eliot Coleman
304 pages, paperback format, $29.95
review by Jack Kittredge

This is pretty much the book Eliot wrote 30 years ago. There are some updates and new passages, but not a lot. You could say the lack of major changes by him is proof that he did a great job the first time, and you would be right.

But I was particularly interested in reviewing this anniversary edition to see if Eliot included any of the new thinking on tillage, information on the role of soil microbiology in plant nutrition or excitement about regenerating land while mitigating climate change via soil carbon sequestration.

The New Organic Grower has been a go-to manual for serious organic farmers for 30 years. Virtually every aspect of what you need to know about small organic vegetable farming in the Northeast is given thoughtful treatment – scale, land, labor, capital, marketing, harvest, crop rotation, cover crops, tillage, fertility, seeding and transplanting, weeds, pests, season extension and greenhouse design, winter production, the importance of tools, incorporating livestock. Some only get 3 or 4 pages, some get many more, and diagrams to boot. But every page bears the imprint of his philosophy – plan thoughtfully, innovate if you don’t like your options, take care with details, focus on quality instead of quantity, be watchful, always learn.

In 2018, given what we now know about climate change and the buildup of carbon dioxide in the atmosphere, a lot of thoughtful farmers are reassessing their practices to be more protective of soil carbon and the microbial biodiversity it sustains. They recognize that regular tillage can be destructive to beneficial fungi (creatures that are crucial to the crop quality Coleman seeks) while it and bare soil are major contributors to the carbon oxidation that fuels global warming. I was hoping to see recognition of the impact of these practices in this volume by someone so committed to innovation and learning. Instead I saw repeated descriptions of various tillage devices and illustrations of them and orderly crops, surrounded by bare soil. The republication of a book of this reach, written by a wise elder, seemed like an opportunity to explore this topic for new readers. I was disappointed that it was not taken.
A-14

The Natural Farmer

Fall, 2018

Symbiotic Earth: How Lynn Margulis Rocked the Boat & Started a Scientific Revolution

a film by John Feldman, published by Hummingbird Films
available from Bullfrog Films for individuals and community screenings at http://symbioticearth.bullfrogcommunities.com/ for $29.95 plus $15.00 shipping
2:27:45 long

review by Jack Kittredge

I have always wished that I had taken advantage of my proximity to Lynn Margulis during the many years she was a professor at UMass before her death in 2011. The time never seemed quite right to interview her on agricultural aspects of microbial behavior, and then, before history had a chance to recognize her Nobel-quality contribution to evolutionary biology, she was gone. This documentary is a tribute to her insights and her willingness to share them. It is composed of many photos and clips of Lynn throughout her life, explaining her work, and of her colleagues talking about her and the revolutionary impact she had on science.

John had interviewed Lynn for a 2005 film, but after she saw the finished product she told him she was disappointed that her views were underrepresented in the film compared to “the neo-Darwinian party line.” John, unaware that there was even a viewpoint called neo-Darwinism, was fascinated and decided to explore Lynn’s ideas as they contrasted with it.

Neo-Darwinism, it turns out, is the view which posits that the variations from one individual to another that, when inherited, lead to evolutionary change are caused by differences in the genes of organisms, and that these differences are caused by mistakes (or mutations) which occur to the genes. This view has been taught for several generations as the synthesis of the work of Darwin on evolution and Gregor Mendel on the gene as the unit of heredity.

Lynn’s fundamental difference with neo-Darwinism challenges neither Darwin nor Mendel, however, just the later assertion that the primary source of variation is because of random mutations. She says, politely, that “there is very little evidence” for the theory that accumulation of such mutations is the way species evolve. For her, new species come primarily from organisms joining with one another. That’s right, joining.

Her first insight into this development came when she encountered a speculation by Ivan Wallin a generation earlier that “mitochondria are symbiotic bacteria in the cytoplasm of the cells of all higher organisms”. Mitochondria are, of course, the “powerhouses of the cell”, organelles in cell nuclei that supply cell energy as well as numerous other vital functions. A mitochondrion has, however, independent of the cell’s DNA, its own genome – which is passed directly in the mother’s egg to the child, through the female line. This led Lynn to propose that nucleated cells evolved from the symbiotic merger of nonnucleated bacteria that had previously existed independently. She soon showed that chloroplasts and cilia were other examples of functional organelles in cell nuclei that had an independent origin, and spent her professional life finding other compelling evidence for her theory, termed, “endo-symbiosis”.

For many non-biologists, the most important difference between Lynn’s thinking about life and that of the neo-Darwinians is this: neo-Darwinism posited competition as the key mechanism selecting for evolutionary fitness, whereas Lynn posited that it was cooperation.

Of course such contrasting forces are easy to politicize. Competition suggested ideas like “masculine”, “capitalist”, and “domination” whereas cooperation suggested “feminine”, “socialist”, and “mutualism”. As the environmental crisis has deepened, many are blaming our plight on anthropogenic thinking, and it’s resulting attitude that humans can exploit and control the earth. We need, they say, to listen to and work with nature, including finding ways to cooperate with other lifeforms. In agriculture the transformative recognition is spreading that tiny microbes are the crucial guarantors of soil health and crop quality – through their ability to symbiotically relate to plants and vastly improve a crop’s nutritional uptake.

This documentary is fascinating as the story of an independent and stubborn woman prevailing against a dominant intellectual brotherhood that initially mocked and belittled her. If you sit through the entire two and a half hours, as I did several times, transfixed, you will learn a great deal that is fascinating about how life surges and adapts, takes every possible pathway, and changes the world it finds until it is better suited for life.
Lynn’s groundbreaking theory of the evolution of life is here summarized. At three different times (represented by triangles in this flow chart) four different strains of bacteria merged, combined their features, and created new kinds of life.
WHAT'S ON YOUR FIELDS?

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