43rd Annual NOFA Summer Conference Heads Back to Hampshire College!

by Jason Valcourt and Hannah Blackmer

Excitement and momentum are building for this year’s 43rd Annual NOFA Summer Conference as it heads back to Hampshire College, where it had many years of success from 1990 to 2007. The rural campus may be familiar to some, and may be entirely new to others, but we are confident that Hampshire College will provide an all-inclusive environment, once again, for our NOFA community to gather together.

With plenty of free parking, trees for shade, close accommodations and Hampshire’s commitment to local organic food sourcing, this year’s conference will provide the close-knit community atmosphere upon which NOFA was founded. The NOFA community will take over the entire campus!

Of course there will be many annual standbys such as Friday night’s contra dance, Saturday’s local dinner celebration and the NOFA Person of the Year Award at Saturday’s keynote session (now moved to Saturday afternoon). Who will it be? As always, the conference weekend will showcase many learning opportunities in and out of Hampshire’s classrooms and also on-site during tours at various nearby farms.

New for this year, NOFA Vermont is bringing their amazing pizza oven on Saturday, and we are rounding up “makers” of all sorts to showcase their various farm and garden innovations with you at the annual country fair, The drumming session typically held during the Saturday keynote session will now take place during Saturday evening’s festivities. Get ready to enjoy yourself after an enriching day of workshops!

Our Friday night keynote speaker is master organic orchardist Michael Phillips from Groveton, NH. Michael will illuminate the inner workings of the world of fungi and its important role in plant health. Michael’s commitment to achieving a balance between production and the natural ecosystem is evidenced in his commitment to the natural world and achieving harmony with it. His new book Mycorrhizal Planet has just been published.

Our Saturday keynote speaker is Emeritus Professor Dr. Don Huber from Purdue University. Dr. Huber is the nation’s leading Glyphosate researcher and has been a major thorn in Monsanto’s side for many years. Mr. Huber has dedicated himself to researching Glyphosate in an attempt to fully educate consumers about its dangers and the extent of its prominence in food production and household application. He has been under attack by Monsanto’s minions for decades but has unwaveringly focused on revealing the dangers of Glyphosate at the expense of his own reputation in certain circles.

Michael Phillips and Don Huber will both present intensive seminars on Friday, August 11.

Friday Night Keynoter Michael Phillips

Saturday Afternoon Keynoter Dr. Don Huber

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Section B: Supplement on Farming for a Living Wage
Letters to the Editor

Dear Jack & Julie,
Please accept this small donation toward The Natural Farmer, which has made an enormous contribution of knowledge and information on organic farming and living to all of us lucky to have the pleasure of reading it.
I look forward to every new issue.
Thanks ever so much,
Susan, Dummerston, VT

Dear Susan,
Thanks very much for your check and kind words. The truth is Julie and I feel very grateful to have the privilege of supporting ourselves by working for something we both so much believe in. Not many people have that chance, plus the added benefit of enjoying a community of so many worthy and like-minded individuals.
Thanks again,
Jack Kittredge

The Natural Farmer Needs You!

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 will be:

- Summer 2017: Pollinators
- Fall 2017: Organic Market Aggregators
- Winter 2017-2018: Forestry Products

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”.

Moving? The Natural Farmer will not be forwarded by the post office, so those who subscribe directly should send address changes to us. Most readers, however, get this as a NOFA member benefit and should send address updates to their local NOFA chapter.

Archived issues from Summer 1999 through Fall 2005 are available at http://www.library.umass.edu/spcoll/digital/tnf/. More recent issues are downloadable (starting 3 months after paper publication) at www.nofa.org as pdf files. We also have many issues archived in convenient downloadable form at www.TheNaturalFarmer.org

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“We have been using Udder Comfort™ for 8 years and just love it in our maternity pen!” says 4th generation dairyman Alan Mesman, pictured above with wife Anita during the 2016 WODPA Conference. Alan and his son Ben and daughter Samantha operate Mesman Farms, a 110-cow robotic organic dairy near Mt. Vernon, Washington.

“As an original user, we did one of the first DHI comparisons 8 years ago, coating udders of high-count cows. We were surprised when our SCCs fell by 40,000. We then transitioned to using Udder Comfort routinely after calving to manage udder edema and milk quality.”

With robotic milking in place 3 years, the Mesmans continue to make sure fresh cows get Udder Comfort.

“We use it in the maternity pen for 4 milkings to remove edema and soothe irritation, especially on the new heifers.

“We like seeing positive change in working with the cows and watching the progress of our Holstein/Jersey herd. Udder Comfort plays a big part, helping fresh cows reach their potential.” — Alan Mesman

MESMAN FARMS, MT. VERNON, WASHINGTON
Alan (Anita), Ben (Chelsy) and Samantha Mesman
Robotic Organic Dairy, 110 cows, SCC 150,000

“0 to 100 in 7 Days!”
CAUSE COMFORT MATTERS.

“We love it in the maternity pen!”
— Alan Mesman

Mesman Farms, Mt. Vernon, Washington
Alan (Anita), Ben (Chelsy) and Samantha Mesman
Robotic Organic Dairy, 110 cows, SCC 150,000

Bejo Carrots
Bejo Seeds is a leading breeder and producer of high-performing carrot varieties. Bejo breeding focuses on strong root systems, optimum nutrient uptake, enhanced disease resistance, and outstanding flavor. Bejo Seeds are available through quality-minded dealers on both a seed packet and commercial scale. Call the number at right for a list of seed sources. See the Bejo Assortment at bejoseeds.com, and the full lineup of 120 organic varieties at organiceedfinder.com

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2016 YEAR OF THE CARROT nbg.org
Have you tried Bejo varieties?

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Root Crop Harvester

Custom built to greatly improve the harvesting of root crops on small- to mid-scale farms

“The Huckins bed lifter has become an essential tool on my farm. It has greatly increased the speed of harvest on our carrot, parsnip, leek, celeriac and sweet potato crops. The bed lifter is easy to attach and use, and is designed to undercut the soil at whatever depth is needed. I highly recommend it!” — DA

Also known as a bed-lifter or undercutter bar, this piece of equipment makes harvesting root crops quick and efficient by completely loosening the soil from below to allow for easy hand harvesting. No more labor-intensive and crop-damaging garden forks with the harvest of carrots, parsnips, sweet potatoes, garlic, and more. Ultra durable and heavy duty.

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Custom built to width; +$50 for widths greater than 4'. Orders must be placed by January 30th, for delivery at the end of May. $250 deposit due at time of order.

More info at www.huckinsforge.com or email/call Brian Huckins: huckinsforge@gmail.com 508-635-7749

News Notes

compiled by Jack Kittredge

First map of smallholder farms in the developing world: They produce more than half the planet’s food calories

Researchers at the University of Minnesota Institute on the Environment (IonE) have used household census data to map smallholder farms in developing countries. The study was published in the journal Environmental Research Letters on November 29, 2016.

“This map is a first step toward a better understanding of where and how smallholder farming can be sustainable for both landscapes and livelihoods,” said Leah Samberg, lead author of the new study and scientist with IonE’s Global Landscapes Initiative. “Despite the fact that smallholder and family farms are crucial to feeding the planet, little is known regarding the location and size of smallholder farms. This study attempts to fill this knowledge gap.”

Small farms exist in some of the planet’s most diverse landscapes and are home to many of the planet’s most vulnerable people, and yet we have very little information about them. Among the key features of the study:

• This study is the first product to use household data to map farming populations and average farm sizes across much of the world. It uses census data from millions of households in dozens of countries to identify farming households.

continued on page A-5
Organic Farming Doesn’t Have To Break The Bank Or Your Back

From soil prep to harvesting, Cummings & Bricker offers affordable products to minimize the impact on your soil while making your work a whole lot easier.

Incorporating Organic Matter Into Your Soil
Kverneland’s 150 series mounted reversible rollover plows are the perfect choice for small to medium size farms who are looking for something light, robust and easy to handle. Recommended for tractors up to 150 HP.

The unique steel heat treatment applied to the complete plow, high performance and long working life is what you can expect from any Kverneland plows.

Well Drained Soil
The Tufline Subsoiler opens deep drainage channels in compacted soil that puddles and does not drain properly. The heavy duty shanks are spaced about 30” apart, and work the soil up to 18” deep. 25 HP per shank is required.

One, two and three shank models are available.

Potato Digger
The Del Morino potato digger easily digs up potatoes, separates them from the soil and leaves potatoes on top of the row. Connects to category I tractors with 3 point hitch and a minimum of 10PH.

Rear and side discharge models available.
News Notes (continued from page A-3)

- It identifies more than 900 places in 83 countries in Asia, sub-Saharan Africa and Latin America where there are fewer than 5 hectares of agricultural land per farming household. These places are likely to be home to a high concentration of small farms and are farmed by more than 380 million households.

- These 900 smallholder hot spots are key sources of many globally important agricultural commodities. For example, they produce more than three-quarters of the planet’s rice and oil palm.

- These smallholder systems produce more than half of the planet’s food calories and convert more than 70 percent of the calories produced directly into the food that people eat.

“This study is only a first effort at utilizing these rich and complex data sets,” said Samberg. “We envision numerous future applications of this farm size product in combination with other variables related to food security, natural resource use and human well-being that will further increase our understanding of the dynamics of small farms and the livelihoods of those who depend on them.”


Roundup Causes Non-Alcoholic Fatty Liver Disease (NAFLD) at Very Low Doses

The weedkiller Roundup causes non-alcoholic fatty liver disease at very low doses permitted by regulators worldwide, a new peer-reviewed study shows. The study is the first ever to show a causative link between consumption of Roundup at a real-world environmentally relevant dose and a serious disease.

The new peer-reviewed study, led by Dr Michael Antoniou at King’s College London, used cutting-edge profiling methods to describe the molecular composition of the livers of female rats fed an extremely low dose of Roundup weedkiller, which is based on the chemical glyphosate, over a 2-year period.

The new results demonstrate that long-term consumption of an ultra-low dose of Roundup at a glyphosate daily intake level of only 4 nanograms per kilogram of bodyweight per day, which is 75,000 times below EU and 437,500 below US permitted levels, results in NAFLD. Regulators worldwide accept toxicity studies in rats as indicators of human health risks. So the results of this latest study have serious implications for human health.

NAFLD currently affects 25% of the US population and similar numbers of Europeans.


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Farm Groups Challenge Food Companies for Using Non-GMOs

A number of food companies have recently announced that they are introducing non-GMO product lines. That is making some farmer groups and biotech companies antsy as they see a slide away from GMO crops. An example was when the Dannon Company announced it was converting its Danon, Danimals and Oikos brands of yogurt to all non-GMO ingredients by 2018. The Dannon Pledge includes switching the diet for the dairy cows that provide the company with its milk to non-GM crops.

“This was a tipping point,” said Randy Mooney, chair of the U.S. National Milk Producers Federation. Chris Galen, vice-president of communications with the federation, said Dannon’s announcement was a tipping point because the company is telling farmers what kind of feed to use for their animals. “This is entirely different and a more far-reaching step than just a focus on biotech ingredients in the yogurt itself,” he said in an email. “If this isn’t addressed, we’re going to see a radical change in how food and feed is produced in this country.”

The American Farm Bureau Federation, American Soybean Association, American Sugarbeet Growers Association, National Corn Growers Association, National Milk Producers Federation and U.S. Farmers and Ranchers Alliance published a tersely worded letter they sent to Dannon. “It appears to be an attempt to gain lost sales from your competitors by using fear-based marketing and trendy buzzwords, not through any actual improvement in your products.”

Dannon shot back with a news release responding to the letter. “We were surprised to receive a divisive and misinformed letter about our efforts to continue to grow America’s enjoyment of dairy products, including yogurt,” stated the company. “We believe there is growing consumer preference for non-GMO ingredients and food in the U.S. and we want to use the strong relationships we have with our farmer partners to provide products that address this consumer demand.”

The dispute illustrates the growing divide between the farm community and its food company customers surrounding the GM food issue. Food companies increasingly want to source non-GM ingredients and to provide labels telling their customers whether products are GM or not. Meanwhile, most conventional farmers continue to embrace the technology. More than 90 percent of the corn, soybeans and canola grown in North America in 2015 were GM varieties.

Randy Kroz, chief executive officer of the U.S. Farmers & Ranchers Alliance, a group that speaks on behalf of about 100 farm organizations, does not accept that food companies are responding to consumer preference. He believes anti-biotechnology activists are behind decisions like Dannon’s. “There is a lot of pressure being applied by organizations targeting (food companies) that don’t necessarily represent broad consumer feelings or opinions,” he said.

Michael Neuwirth, spokesperson for Dannon, said Kroz is mistaken. The decision to switch half of its product line to GM-free ingredients came from continued on page A-7.
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the company’s daily interaction with its customers and from market research data on shopper preferences. “That’s our business – understanding what people want. That’s the reason we have a wide range of products,” he said.

Part of Dannon’s sustainability pledge is to provide a fixed margin of profit to its farmer partners who provide the company with its milk.

source: www.produce.com/2017/01/farm-groups-challenge-food-companies-non-gm-pledge/

ConAgra dealt blow by ninth circuit in ‘100% natural’ case

A hotly-anticipated opinion by the US court of appeals for the ninth circuit in a high-profile false advertising case contains bad news for defendant ConAgra Foods (now ConAgra Brands), say attorneys. The lawsuit consolidates legal actions in multiple states alleging ConAgra falsely advertised Wesson-branded cooking oils as ‘100% natural’ when they were made from GMO crops.

So far the court has only upheld a lower court’s certification of the consumer class in the case. But an unpublished memorandum, which indicates the judge’s thinking on broader issues but cannot be used as a precedent in other cases, indicated the judges were skeptical of ConAgra’s argument on several other legal issues. While none of these have been decided, much less the actual issue in the case – whether or not GMOs can be labeled ‘100% natural’, the memo has given the plaintiff’s comfort.


Quinoa genome decoding could see ‘super-food’ prices tumble

Scientists have successfully decoded the genome of quinoa, one of the world’s most nutritious but underutilised crops. The South American grain is a hugely popular “super-food” because it is well balanced and gluten-free. Prices for quinoa, however, have rocketed in recent years as demand exceeded supply.

Experts say that quinoa was first domesticated more than 7,000 years ago around Lake Titicaca in the Andean highlands and centuries later became known as the “mother grain” of the Inca empire. After the arrival of the Spanish, the crop was marginalized and never fully domesticated or bred to its full potential. The crop grows at high altitudes and in cool temperatures, factors which have limited its production outside of Peru, Bolivia and Ecuador, although many countries grow small amounts. However the nutritional composition and the fact that quinoa is gluten-free, high in protein and moderate in carbohydrate has seen international demand for the foodstuff soar. Prices tripled between 2006 and 2013 principally because quinoa’s adoption as a “super-food” in Europe and the US. Researchers believe knowledge of the genetic code, however, will rapidly lead to more productive varieties that will push down costs.

“By sequencing the genome we have provided the foundation to enable breeders to work much faster and more powerfully,” said project leader Prof Mark Tester, from King Abdullah University of Science and Technology (KAUST). The re-continued on page A-8
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searchers at KAUST were drawn to quinoa because of its ability to tolerate salt. The Saudi institute was interested in the crop because they believe it has great potential to grow in poorer soils, such as those in the Middle East, including those with a high salt level.

The researchers say they have already made a key discovery because of the genome. Quinoa seeds contain saponins, bitter and toxic compounds that protect the plant from predators. Removing the saponins for human consumption drives up the costs of processing. “We’ve pinpointed one of the genes that we believe controls the production of saponins in quinoa which would facilitate the breeding of plants without saponins to make the seeds taste sweeter,” said Prof Tester.

Researchers believe that genetic sequence of the grain will boost the production and popularity of the grain and it may no longer be the preserve of middle class foodies in richer countries.

“They can keep enjoying it,” said Prof Tester. “But they just might get a bit annoyed that what they’re eating is not so unusual and everyone else is eating it too.”


Organic standards will exclude next generation of GMOs

The National Organic Standards Board voted unanimously at its November meeting to update U.S. organic standards to exclude ingredients derived from next generation genetic engineering and gene editing. This recommendation to the US Department of Agriculture’s National Organic Program will ensure that ingredients derived from new genetic engineering techniques, including synthetic biology, will not be allowed in the production or final product of foods and beverages that are certified organic. Synthetic biology is a new set of genetic engineering techniques that include using synthetic DNA to re-engineer organisms to produce substances they would not normally produce, or to edit DNA so as to silence the expression of certain traits.

“The Board’s hard-fought proactive stance on synthetic biology will both help preserve the integrity of organic standards and raise awareness about this virtually unregulated and unlabeled form of genetic engineering,” said Dana Perls, food and technology policy campaigner with Friends of the Earth. “It’s critical that organic standards treat new types of genetic engineering that are rapidly entering our food and consumer products as rigorously as the first generation of GMOs.”

Like “traditional” GMOs, synthetic biology ingredients are entering food and consumer products in absence of adequate health and environmental safety assessment, oversight and labeling. Many are being falsely marketed as “natural.” Products in development include synthetic biology stevia, saffron, coconut and cacao, meant to replace plant-based ingredients, many of which are currently produced by small farmers in the Global South. There is increasing concern that these farmers’ livelihoods may be displaced by synthetic biology ingredients. Other products include gene-silenced apples, CRISPR waxy corn.
News Notes (continued from page A-8)

and Cibus Canola oil, engineered with gene editing techniques. “The definition of Excluded Methods in the USDA Organic Regulations was written in 1995,” said Zea Sonnabend, NOSB scientist representative. “With so many new technologies being developed since then that continue to challenge both regulation and agro-ecology, the NOSB felt it was important to provide a structure to clarify the original definition so that organic consumers can be assured that their food does not contain GMOs.”

“The National Organic Standards Board has made clear that all kinds of genetic engineering are to be excluded from ‘organic.’ The public expects that government to actually assess the new foods that it is permitting on the market,” said Jaydee Hanson, senior policy analyst, Center for Food Safety. “Unfortunately, the government has failed to update its regulations to adequately assess these new kinds of genetically engineering. When the USDA approves that NOSB recommendations, consumers who want to avoid GMOs will be able to use the Organic Seal to know that the product is not a GMO.”

The Board’s announcement follows a growing trend of companies stating that they will not use ingredients produced via synthetic biology. The Non-GMO Project, North America’s only third party verification program for non-GMO food and products, recently updated its standards so as to include synthetic biology and new gene editing techniques. Companies such as Ben and Jerry’s (BJIC: US), Three Twins Ice Cream, Straus Family Creamery, Luna & Larry’s Coconut Bliss, Nestlé (NSRGY: OTC US), and General Mills (NYSE: GIS) have committed to “...not source vanilla flavor produced through synthetic biology,” a product that is designed to replace natural vanilla flavoring from vanilla beans. Synthetic biology vanilla flavoring, introduced by Evolva (SWX: EVE) and International Flavors and Fragrances (NYSE: IFF) in 2014, is the first major synthetic biology ingredient to enter food and beverages, marketed as “natural vanilla.” Other companies that have pledged to avoid synthetic biology ingredients entirely include Nutiva and Dr. Bronner’s.


NOFA-NY Organic Dairy & Field Crop Conference Now 2 Days NOFA-NY is expanding its annual Organic Dairy & Field Crop Conference to two days: March 16-17. The conference takes place at the Holiday Inn Syracuse/Liverpool, NY.

The keynote speaker is Jack Lazor, co-founder of Vermont’s Butterworks Farm. Lazor has been a pioneer in alternative management practices on his dairy, moving from small scale production to a complete grass-fed management. Jack also will share his insights into carbon sequestration and the future of Butterworks Farm. The pre-registration deadline is March 7. To register, call 585-271-1979 x1, or register online at: [www.nofany.org/dairyconference](http://www.nofany.org/dairyconference).

source: NOFA-NY press release, January 31, 2017
Mycorrhizal Planet: How Symbiotic Fungi Work with Roots to Support Plant Health and Build Soil Fertility
by Michael Phillips
published by Chelsea Green Publishing, White River Junction, VT
2017, 256 pages
review by Julie Rawson

As the wife of the editor I see all the books that come in for review - and I get to cherry pick the ones I want to review. When I saw this title, and its author, I knew it would be well worth my while. Thankyou, Michael, for your dedication to Jerry Brunetti – “You walked the walk with cows and herbs in the rolling hills of Pennsylvania. Your green insights and cheerful tenacity will long be appreciated. Godspeed brother.” Jerry Brunetti became a good friend and colleague of mine. His far-reaching vision, and his insights regarding soil, animal and human health have informed much of what NOFA/Mass does today.

Phillips has a playful, poetic style, and he anthropomorphizes soil micro-organisms. At times I found this style confusing, but in large part I enjoyed his light touch. He succeeds in disseminating complex scientific information in a manner that kept me attentive and often chuckling. Take, for example, his first sentence: “Mycorrhizal fungi have been waiting a long time for people to catch on.” It turns our usual interaction with soil on its head. I have walked away from this book with my thinking inherently changed; I can’t walk anywhere now without considering the ones under our feet who really run the show -- if we let them. I look forward to this spring, to work with the mycorrhizal fungi and all the others living down there.

Chapter 1 explains how mycorrhizae work. In short, mycorrhizal fungi are the ticket to healthy plants. As Phillips puts it, “The fineness of hyphae in comparison to the relative blunt hairs on feeder roots reveals how mycorrhizal fungi can access diverse nutrient niches.” He presents a long list of symbiotic benefits to plants, including...
increasing surface area of nutrient uptake, unlocking phosphorous for plants, acquiring nitrogen from organic matter, improving uptake of trace minerals, and enhancing nutrient density of crops. In seedlings, these fungi prevent damping off disease, reduce transplant shock and support root initiation with cuttings. In field and forest they stabilize soil aggregates, break up subsoil compaction, suppress non-mycorrhizal weeds, cut fertilizer requirements and improve tolerance of high soil temperatures. They improve photosynthesis, provide a co-factor role in protein synthesis, reserve energy and stimulate induced systemic resistance. Finally, mycorrhizal fungi are networkers that ensure balanced nutrient uptake, healthy forest succession, facilitate plant to plant communication and are the foundation for ecosystem resiliency.

Mycorrhizal fungi come in a variety of formats, from tree-oriented ectomycorrhizal fungi on one end, and arbuscular mycorrhizal fungi - often associated with vegetables - on the other end of the spectrum. Mycorrhizal fungi can be “ecto” or “endo”, developing on the outside of plant roots or within the walls of the root. Soil microbiologists count some 150 species of arbuscular mycorrhizal fungi that colonize the roots of plants, all with specific roles to play in nutrient and water transport. Fungal hyphae systems are capable of fusing together. This facility to build bridges of a common mycorrhizal network can literally link the roots of all plants at a site.

As a grower seeking best practices for keeping the mycorrhizal community strong all year long, I found it useful to learn that “endo” species will stay alive in plant roots for a period of time, whereas the “ectos” die off more quickly, with nothing to eat when there is no photosynthesis. I gave up pulling plant roots a couple of years ago, and, newly re-affirmed, will continue this practice.
From the author himself:

Mycorrhizal Journey: Tales from the Far Side of the Orchard
by Michael Phillips
Lost Nation Orchard, New Hampshire

The invitation was tantalizing, to say the least. “We need to have someone write a book about mycorrhizal fungi.” My longtime editor and friend, Ben Watson of cider acclaim, said this to me in casual conversation at a Chelsea Green Publishing meet-up of authors and staff two years ago. You could say Ben was speaking my language, knowing as I do the critical importance of symbiotic fungi in growing healthy fruit.

The game was afoot! And for me, a book project always begins with a working title to go with a detailed outline of what needs to be probed, shuffled, and shaped into practical application for growers. A month or two of consideration during the start of pruning season led to a surefire proposal, and soon enough, the writing of Mycorrhizal Planet became a daily habit backed by pure fungal intuition.

Only that was not the title at the time. Imagine this. You get on an airplane in the predawn hours, having spoken at a distant conference one wintry weekend. A woman sits next to you, someone you’ve never met and yet absolutely know. You get down on one knee in mid-air and propose marriage. A thrill. But this was not the title at the time. Imagine this. You get on an airplane in the predawn hours, having spoken at a distant conference one wintry weekend. A woman sits next to you, someone you’ve never met and yet absolutely know. You get down on one knee in mid-air and propose marriage. A thrill. But this was not the title at the time. Imagine this. You get on an airplane in the predawn hours, having spoken at a distant conference one wintry weekend. A woman sits next to you, someone you’ve never met and yet absolutely know. You get down on one knee in mid-air and propose marriage. A thrill. But this was not the title at the time.

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Imagine all of this and more. From the author himself:

The notion that “plant toes being tickled by fungi” bestows life to our dear planet—and so many two-leggeds don’t even have a clue—means the time has come to tell the full story about mycorrhizal fungi. (Many of us know Michael from his two classic orcharding books, The Apple Grower and The Holistic Orchard. We thought it would be fun to get an inside perspective of how a next book comes to be.)

...little knowing there was so much intrigue along the time line perspective of how a next book comes to be...
In Chapter 2, Healthy Plant Metabolism is discussed. Phillips establishes a first principle, namely that pests and pathogens are symptoms of a breakdown of natural systems. His antidote to this is healthy plant management, involving complete metabolism pivoting on mineral availability and mycorrhizal collaboration. Or, as he labels it, "Wharney, Vitality, Joie de vivre." In this chapter he discusses photosynthetic efficiency, protein synthesis, co-factors of plant enzymes, fat energy and biological reserves. He recognizes a lot of the work of John Kempf in this chapter. I underlined this statement as an important farmer take-away—"...when plants begin absorbing the greater portion of their nutrition as microbial metabolites, the 'energy efficiency quotient' of biosynthesis goes through the roof..." In other words, I must put my energy into providing the workspace for the microbial underground to work as efficiently and effectively as possible.

Foliar feeding is discussed as a way to keep track of the colonized vegetation that goes on above ground, and to design your foliars with the health of these microbial friends in mind. He goes on to discuss systemic acquired resistance (SAR) and induced systemic resistance (ISR), two forms of resistance whereby plant defenses are pre-conditioned by prior infection or treatment that results in resistance against subsequent challenge by a pathogen or parasite. This chapter ends with discussion of those wonderful Plant Secondary Metabolites that bring the extra flavor, aroma, vibrant color and disease resistance that comes with a saprophytic fungi. These are the decomposers. The mutualists are the mycorrhizals that form the relationships with the plant roots. Pathogens we all know about and parasites can be working for "good or ill" from the human perspective. For the true student of fungi and their roles, Phillips goes into somewhat greater detail about the dual roles of saprophytic fungi in living and dead plant breakdown.

Plants get 95 percent of their nutrition from air and water — carbon, hydrogen and oxygen. Roots work best to get the remaining 5% of their nutrition when in collaboration with mycorrhizal fungi. Photosynthetic rates determine the amount of ready carbon that roots have to trade. Phillips postulates that the effectiveness of any one plant will be improved in its connection to the other plants in the soil due to the intricate hyphal networks that provide a balanced array of mineral nutrition to all the plants as long as their needs are met through optimum photosynthesis. Hyphal pipelines move nutrients from areas where resources are high to areas where resources are low. The bottom line is that everyone is working together.

Michael's list of suggestions for those who would honor their mycorrhizal fungi are enumerated here. "Whatever you are doing now you can undoubtedly do better" says he.

- Fungicides, herbicides and insecticides no longer have a place in agriculture.
- Synthetic nitrogen fertilizers are directly tied to the decline of soil carbon.
- Tillage reduces the efficacy of mycorrhizal by disrupting the extraradical hyphal network.
- Conventional monoculture needs to be revised.
- Animal husbandry needs to be an integral part of long range fertility strategy on diversified farms once again.
- Farm consolidation to the detriment of vital rural communities was a big mistake.
- The mad destruction of forests worldwide needs to stop.

The remainder of the book is about practical ways to support the mycorrhizal world as a farmer or any type of land steward. Addition of the use of fermented plant extracts to fungal products for use in inoculating seeds is covered. As he is an orchardist first and foremost, he goes into great detail about the best timing and methodologies for mycorrhizal "accluar" in the orchard. There are some good tips for gardeners too. My main take-away in that realm was to be more generous to the perennial plants in my otherwise annual system. I plan to add at least one bed of flowering perennials in each of our approximately 1/2 acre pieces of vegetable growing area. These can be cut and sold for flowers or medicinal herbs and also provide pollinator and beneficial habitat above ground, as well as a permanent root system underground. We have moved to no-till on our farm, which opens up a lot of opportunities for mixing and matching in a previously traditionally annual system.

In addition, I learned about the timing on the root flush in apple trees, which happens in spring after blossom time as well as by the end of August, when terminal buds on shoots actively stop growing. Considering that fungal growth will accelerate at this time, he suggests that cutting the grass under trees right after fruit set will provide the fungi the extra carbon needed to thrive. He is strong on lipid-based food sources for fruit trees, and prefers fish hydrolysate and neem oil in foliar applications.

Michael ends the book with short sections on edible mycorrhizal mushrooms, animal culture, cover crop cocktails and finally a Soil Redemption Song. "Perhaps the real gift of the fungi and the plants isn't the 'carbon solution' as much as it is showing us a wayward. That to cooperate is to find bounty for all involved... Beneath our feet is the teaching and the blessing." That message makes me smile, and also makes me think about...
The issue of gluten intolerance and wheat allergies is...
baked goods. Eli’s wheat of choice is einkorn and that is her expertise in cooking. As this is a book about a variety of heritage wheat, I would have liked some recipes using different varieties or adaptations to accommodate other varieties, such as using blau emmer for farro and a durum for pasta. Still, there are a diverse offering of recipes.

Following that are two appendices and a list of resources: the first appendix is on baker’s formulas and the second on why modern wheat is making people sick. I’ll not discuss either. You can seek out the book and discover the answers yourself.

Rogosa’s book is one of the few books on wheat cultivation (besides textbooks) and a must-have for anyone interested in wheat. With its scope of the history of wheat cultivation and cultivars, the extensive and diverse discussion of folklore and cultural history, growing methodology, and recipes, it is a mini-encyclopedia of all things wheat.

The Beef Industry: What They Don’t Tell You by John Peirce, DVM
Santa Fe, NM: Sunstone Press, 2015, sunstonepress.com
$26.95, paperback, 229 pages
about 70 photos, some color and some black and white
reviewed by Bob Banning

Dr. John Peirce, veteran veterinarian, would like you to listen to the perspective of conventional beef producers. So would I. But I would also appreciate it if he himself spent more time listening. To see what I mean, read on.

Peirce wants his readers to know “what they don’t tell you” about the U.S. beef industry. “They” are the industry’s “critics,” “you” are consumers who object to how the industry operates, and what you have misinformed many consumers and manipulates their emotions, he says, with the result that they have wrongly found fault with conventional producers and are opposed to what the media tell us) should lead readers to admire the conventional beef industry and lose their enthusiasm for the alternatives, which to him are merely marketing ploys lacking a solid foundation in good science and good management.

To enlighten readers, then, he explains things like the following:
• how his principles of “Genuine Care & Concern for the Individual” (the individual animal) have been adopted by the industry, reducing stress for many beef cattle and leading to higher productivity and profits
• how well cattle are cared for at feedyards (“like sending your son or daughter off to college—there is an adjustment period” p. 117)
• that, contrary to popular opinion, antibiotics are actually used very carefully, only with a prescription from a veterinarian, and that “resistant strains [of bacteria] are principally sourced in hospitals, where strong disinfectants are used” (p. 207)
• that the carbon footprint of conventional beef production is actually smaller than that of grass-fed or organic production.

I credit Peirce with enlarging the gray area for me in a lot of the issues he discusses. He speaks from firsthand experience, and I can’t dismiss most of his arguments out of hand on the basis of what I personally know. I also am inclined to believe him when he says the ranchers he’s dealt with have generally been strong, savvy people who care about the well-being of their animals.

Yet the book’s argument is weakened by significant flaws. Most notably for readers of The Natural Farmer, the author does the significance of organic beef in less than one page. A few years ago, he considered producing organic beef, he says. When he investigated several organic operations, he “was not comfortable” with what he saw. He didn’t believe animals could be well cared for without practices that are prohibited under organic regulations, and he felt the costs would be too high.

Thus he fails to acknowledge any of the scientific and practical knowledge that has accumulated around organic agriculture in the last seventy years. It’s this knowledge, rather than mere emotion, that is the actual basis for many people’s decisions to buy organic beef. The author does cite scientific studies to back up some of his claims, but gives the huge volume of literature available arguing both for conventional agriculture and for organic, to claim that the science he cites is the only kind worth listening to is to oversimplify the whole debate. (Peirce could have gained himself some space in the book for a more substantive debate with organic if he had cut out of hand on the basis of what I pres inside a few years ago, he considered producing organic beef, he says. When he investigated several organic operations, he “was not comfortable” with what he saw. He didn’t believe animals could be well cared for without practices that are prohibited under organic regulations, and he felt the costs would be too high.

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