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MOTHER EARTH NEWS

HERBS TO HELP YOU SLEEP — PAGE 75

THE ORIGINAL GUIDE TO LIVING WISELY

OCTOBER/NOVEMBER 2014

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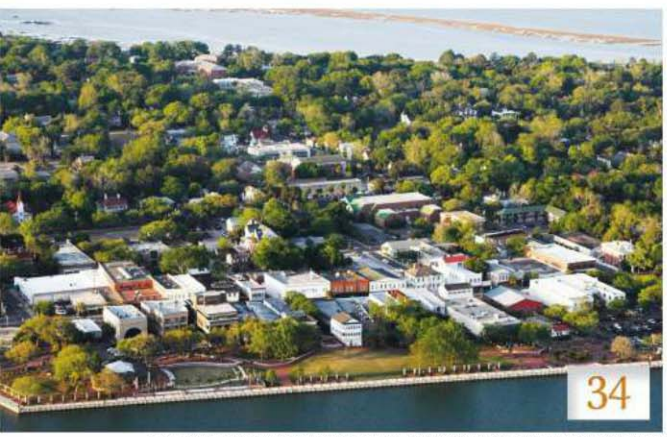

DREAMSTIME/JOHN WOLLWERTH; BELOW: GREG GARBOS; RIGHT: LISA RICHARDS

MORE THAN A MAGAZINE ... A WAY OF LIFE

Cover Story

Features

BARBARA DAMROSCH

ELAYNE SEARS

NEIGHBORHOOD RESTAURANT GROUP; BELOW: BRUCE MCGLENN

MORE THAN A MAGAZINE ... A WAY OF LIFE

Departments

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The Shift to Renewables Gains Momentum

For almost 45 years, readers of MOTHER EARTH NEWS have led the way in creating self-sufficient lifestyles more connected to the land—and often disconnected from the fossil fuel-dependent power grid. By raising solar panels on your roofs, tapping the power of the wind, building greenhouses, planting gardens, and just generally being frugal and inventive, you have shown the world that a more conscientious, sustainable way of life can be rewarding and fun.

Today, that lifestyle is more attainable than ever, as the number of renewable energy options grows rapidly while the costs steadily come down. In 1977, solar panels cost $75 per watt; today, the price has plummeted to about $1 per watt!

Cost of Solar Panels
1977: $75 per watt
1998: $10 per watt
2014: $1 per watt

In this issue's cover story (Page 26), homesteader Cam Mather outlines the 20-year adventure he and his wife, Michelle, have enjoyed as they've developed their off-grid farm in Ontario. Today, their hybrid solar/wind system powers all the comforts of home, using only 16 percent as many kilowatt-hours as the average U.S. household. Plus, they never pay a utility bill.

The Mathers heat their 1888 farmhouse with wood cut from their property with a solar-powered chainsaw. If you were building a new home today, you could easily design and insulate it so that it would require even less energy than the Mathers' retrofit.

Here in Kansas, MOTHER's publisher, Bryan Welch, installed a grid-tied solar PV system on his barn last year. Under a lease-to-purchase contract with a local solar installer, Welch paid nothing upfront. Now his home and farm run entirely on renewable solar power instead of power from coal, and he makes monthly payments to the solar installer instead of to the local utility. Welch drives a leased Chevy Volt for his 60-mile daily commute—most of those miles on electric power provided by the sun. His savings in reduced fuel costs virtually pay for the car. Welch and his wife, Carolyn, are looking at new plug-in electric cars that will lower their fuel bill (and carbon footprint) even further.

This good news about renewable energy extends well beyond wiser-living possibilities on our homesteads. Large-scale wind farms can now deliver electricity at rates that are competitive with those of coal-burning plants, and dozens of utility-scale solar PV power plants are coming online.

In the green transportation sector, electric and hybrid cars have now entered the mainstream. The all-electric Nissan Leaf and the plug-in hybrid Toyota Prius are both priced at less than $30,000. Many of us can't or don't wish to spend that much money on a new car, but used versions of these vehicles will be entering the market in a few years. As engineers continue to improve batteries and charging systems, prices on new models are sure to continue to come down while performance steadily improves. (Stay tuned: Our next issue will include an article about five amazing plug-in electric cars now on the market or racing down the pipeline.)

From where we sit, the transition from fossil fuels to solar energy and other renewables is making remarkable progress.

—*MOTHER*

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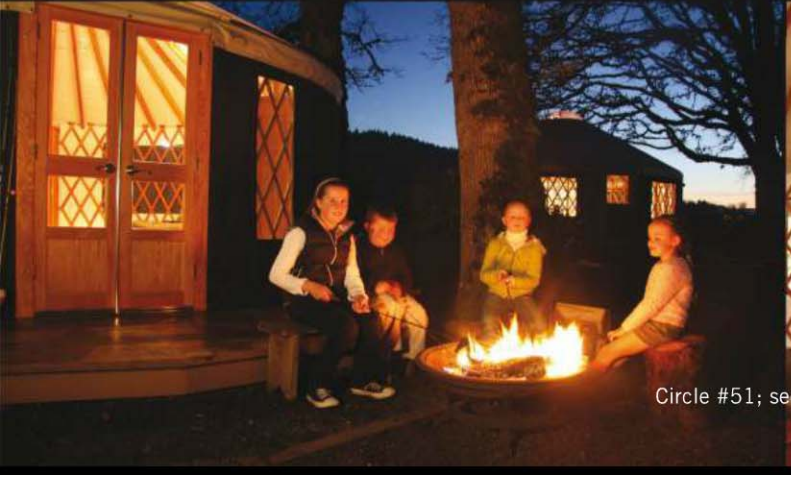

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Circle #29; see card pg 81

MADE IN AMERICA

"A pared-down, fewer-gadgets home design was more in keeping with our life philosophy."

Reader Tracey Allen's home on Prince Edward Island features south-facing windows for maximum solar gain, a hallmark of passive solar design.

EDITORS' PICK

A Good Reason for Anger

I've long been aware that supermarket meats are pumped full of a salt-water solution, as you detailed in "What's Really in Supermarket Meat" (Green Gazette, August/September 2014). I'm angry I can't find meat that doesn't contain nearly the entire recommended maximum salt intake for one day in just one serving, as my husband must limit his sodium consumption for health reasons. Having an excessive amount of salt in every piece of grocery store meat hasn't always been the status quo—nor has it always been legal.

About 50 years ago, I knew a butcher who had lost his shop. When I asked why, he told me he'd added water to the meats he sold to increase profits, and he'd been caught. Back then, to my knowledge, it was illegal to pump water into meat to make it heavier. Now, injecting meat with salt water is pervasive and completely acceptable. We all know why these ingredients are added. It's not to enhance flavor—it's purely done for profit.

Nancy Ward
Livingston, Texas

Our Low-Tech Solar Home

I appreciate the discussion regarding your April/May 2014 Ask Our Experts piece "Passive House: Beyond Passive Solar" on the MOTHER EARTH NEWS website. (Read the conversation at *http://goo.gl/tf27SG*.) My husband and I found that passive solar design suited our climate here in eastern Canada far better than a home built to the Passive House standard would have.

We built our house in 2012 using the "old technology" of passive solar, and we couldn't be happier with the results. We looked at the Passive House standard, but with our simple approach and budget constraints, we decided that a pared-down, fewer-gadgets home design was more in keeping with our life philosophy.

We hired an architect, who went to the building site to pick the perfect elevation and orientation for our home, and that was the best money we spent on the project. We didn't install in-floor heating, as that would've defeated the whole purpose of using the sun's energy to heat our floors. We also opted for natural, earth-berm construction rather than using a mechanical geothermal system. (You can take a video tour of our home on YouTube at *http://goo.gl/qPDXfQ*.)

When we have renewable energy students from the local college out to view our place, they always want to see the "mechanics," but what we have instead is the least amount of expensive, will-eventually-need-to-be-repaired items in our house. In our case, less is more. Thank you, MOTHER EARTH NEWS, for bringing the topic of passive solar home design back to the forefront from the 1970s.

On a side note: I wrote a book from my perspective as the owner of a passive solar home, and when I delivered it to the local library, the librarian said he was so pleased to have an "updated" version, because

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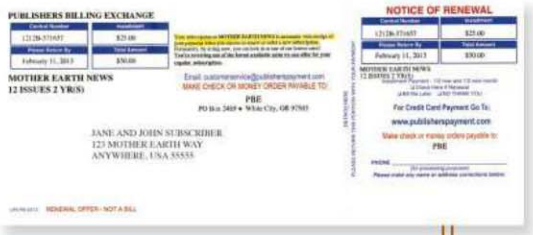

all of his books on passive solar were from the '70s. I didn't have the heart to tell him we worked from 1970s information when building our home!

Tracey Allen
York, Prince Edward Island

'Homestead Hamlet' Reports Wanted

Mother Earth News is my dream magazine come true! I was particularly moved by the recent article about residents of a neighborhood in Nebraska working together to become more self-sufficient ("How We Created a 'Homestead Hamlet,'" April/May 2014). The author's point that we so often plant things in our lawns that we can't eat really struck a chord with me.

In my neighborhood, more people are beginning to garden, but I still receive mixed reactions about the large size of my garden. It makes me wonder: Are any other neighborhoods or areas in this country or elsewhere also embracing community self-sufficiency? I'd be interested to know, and to hear the pros and cons.

Elizabeth Wall
Johnston, Iowa

We're interested, too! We'd love to receive reports from readers about "homestead hamlets" in their cities or towns.—Mother

Gardening in Drought

I enjoyed the article "Top Gardening Challenges and How to Overcome Them" in the April/May 2014 issue. I'd like to add another idea for dealing with drought, and it's a strategy that's one-and-done: *hugelkultur*.

This is the practice of planting into beds that were made by covering logs with soil. As the logs decompose, they keep the soil moist, but not too wet. The arrangement will last for years, and some reports claim you'll no longer need to water at all!

You can read more about *hugelkultur* and see photos of the process at *www.RichSoil.com/Hugelkultur*.

Julia Franke
Kutztown, Pennsylvania

Dangers of Biogas

Your article about do-it-yourself biogas ("Make a Biogas Generator to Produce Your Own Natural Gas," August/September 2014) causes me grave concern for several reasons. For one, the open, inverted-barrel storage system shown in the article will at times overflow and allow biogas to escape into the surrounding air. This creates an extremely high risk for explosions.

Safe handling of any volatile, flammable gas—be it biogas, natural gas or propane—requires regulators, leak testing and knowledge of proper connections. In my opinion, the brief "Safety Considerations" section in the article was superficial and totally inadequate.

William Best
Arlington, Washington

'Peddle' or 'Pedal'?

I love Mother Earth News and study each issue from cover to cover. I try to save

(CONTINUED ON PAGE 78)

Interweaving Wind and Solar

Regarding the article "Renewable Energy Options for Your Homestead" (June/July 2014): We found installing a residential wind turbine to be a great decision, and one of the factors that was important to us was the ability to link the turbine to a solar array. We picked the Pika wind turbine (*www.Pika-Energy.com*) in part because of its microgrid technology that lets us run a hybrid of wind and solar on one system. Here's a photo of our setup.

Audrey Greenhill Lones
North Yarmouth, Maine

NATHAN BROADDUS

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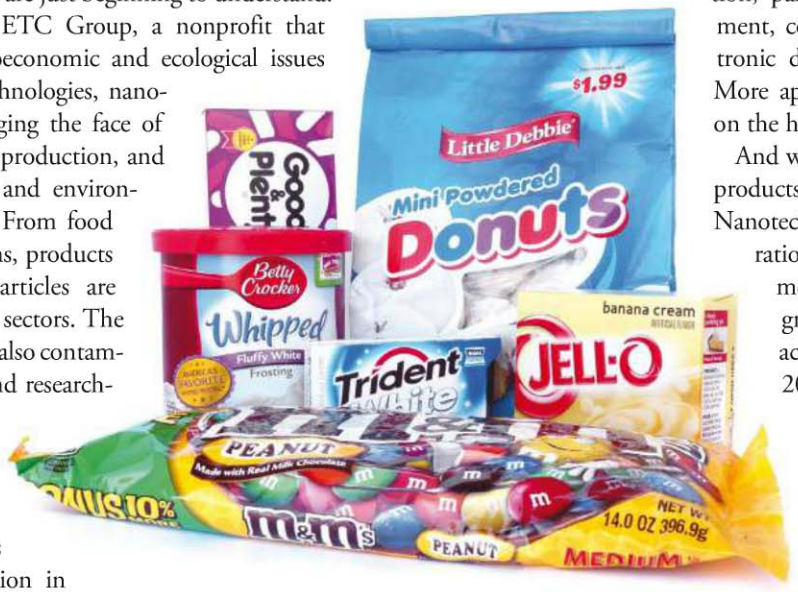
Is Nanotechnology Safe?

"Nanotechnology" refers to the manipulation of matter on the scale of the nanometer—one-billionth of a meter, or 1/100,000 the width of a human hair.

The practice sounds futuristic, but scientists and product developers have actually been experimenting with nanotech since 1981. Modern manufacturers take a common compound, such as carbon, silver or titanium dioxide, and, from it, create ultrafine "nanoparticles." This resulting nanomaterial can offer advantages—such as being strong, having an antimicrobial effect or producing a desired color—but it behaves in different and unpredictable ways compared with its unmanipulated parent compound. For example, one study of rats showed that nanoparticles of titanium dioxide produced 43 times more pulmonary inflammation than larger particles of the compound. Always looking for ways to edge out competitors, companies have shown little concern for this technology's human-health and environmental-toxicity risks, which, notes the Center for Food Safety, scientists are just beginning to understand.

According to the ETC Group, a nonprofit that investigates the socioeconomic and ecological issues surrounding new technologies, nanoscale science is changing the face of health care and food production, and has profound social and environmental implications. From food additives to sunscreens, products that contain nanoparticles are popping up in many sectors. The pervasive particles are also contaminating waterways, and researchers at Plymouth University in England found that titanium dioxide nanoparticles cause oxygen starvation in fish, which in turn leads to poor muscle performance and neurological problems.



What you can't see may hurt you: Each of these products contains nanoparticles of titanium dioxide, a whitener with possible health risks.

Europe and Canada have laws regulating nanotechnology, but the United States has issued only voluntary guidelines for manufacturers. The U.S. Food and Drug Administration (FDA) passed its final guidance on nanotech in June 2014. It recommends that companies consult with the FDA before taking products to market, and warns that nanotech products may require additional safety reviews on a case-by-case basis.

"It's good that [the FDA] recognizes a need for careful review, but the agency should take a more active approach. Under these guidelines, companies will consult with the FDA, but the FDA will not review products for safety," says Jaydee Hanson, senior policy analyst for the Center for Food Safety. "Guidances alone are not sufficient to account for the novel risks of nanotechnology. The FDA must issue mandatory regulations."

According to the Center for Food Safety, nanoparticles in food or food packaging can gain access to the human body via ingestion, inhalation or skin penetration. Nanoparticles' small size allows them to circulate through the body when ingested, reaching potentially sensitive target sites, such as bone marrow, lymph nodes, the spleen, the brain, the liver and the heart. After nanoparticles are in the body, some types may have the ability to translocate to various organs and the central nervous system. For example, silver and carbon nanoparticles show up in other parts of the body after inhalation exposure.

Products already on the market that contain nanotech-produced substances include personal care products, cosmetics, pesticides, food additives, food packaging, cutting boards, dental implants, eyeglasses, clothing and textiles, some types of insulation, paints, boat hulls, sports equipment, computer chips and other electronic devices, and automotive parts. More applications of nanotech appear on the horizon every day.

And what's the revenue of all of these products? According to the National Nanotechnology Initiative, a collaboration between 20 U.S. government agencies and private-sector groups, it was about $251 billion across the global economy in 2009, and it's estimated to grow to $2.4 trillion by 2015. In other words, nanotech's slice of the pie—and any regulation that could potentially throw a wrench in those profits—is no small matter.

The FDA took from 2006 to 2014 to move from draft guidances to a final guidance on nanotech, so implementing mandatory regulations could take many more years. Meanwhile, companies will thrust a steady stream of new products that contain nanoparticles in front of consumers—and, based on current guidelines, none of those products will be labeled as such.

To find out whether a food or product in your shopping cart contains nanoparticles, go to the Consumer Products Inventory at *www.NanotechProject.org/cpi*, or check out the free associated app, *findNano*.

—Shelley Stonebrook

HANNAH KINCAID

Another Study Links Bee Decline to Pesticides

A new study from Harvard University has concluded that systemic neonicotinoid pesticides contribute to honeybee colony collapse disorder (CCD), which has claimed billions of bees since it was first identified in 2006. In the study, all of the previously healthy colonies of bees exposed to imidacloprid or clothianidin—types of neonicotinoid pesticides—from July to September 2013 either died or exhibited CCD symptoms during the winter months. (Read the full study by going to *http://goo.gl/Gtpt2N*.)

"We demonstrated again in this study that neonicotinoids are highly likely to be responsible for triggering CCD in honeybee hives that were healthy prior to the arrival of winter," says lead author Chensheng Lu, associate professor of environmental exposure biology at the Harvard School of Public Health.

Imidacloprid and clothianidin are among the most widely used neonicotinoid pesticides, but many more are on the market, including cyantraniliprole, a new one from DuPont. These systemic pesticides make all parts of a plant poisonous to insects—even the pollen and nectar, which are gathered and consumed by honeybees and other pollinators. The effects can be fast or slow, depending on the dosage and whether other chemicals are included in the mix. In spring 2014, the bees in more than 80,000 hives were found dead or damaged after the bees worked California almond orchards in which neonicotinoid pesticides had been combined with other chemicals, all in keeping with the pesticide labels' directions.

The European Food Safety Authority has banned the use of neonicotinoid pesticides, and the U.S. Fish and Wildlife Service announced this year that these potent chemicals will be banned in the 150-million-acre National Wildlife Refuge System by January 2016. Next up, we must demand that the U.S. Environmental Protection Agency ban these insecticides nationwide, too.

Toxin overload: Biologists have found more than 150 different chemical residues in bee pollen.

To take action by making your yard a safer place to be a bee, consult resources from the BEE Protective program, launched by the groups Beyond Pesticides and the Center for Food Safety, at *http://goo.gl/uTXNiw*.

—Barbara Pleasant

2 New Tools: Grain Thresher and Cider Press

Growing your own grains is no more difficult than growing most other garden crops, and you can easily harvest a small plot by hand using a lightweight scythe, such as those offered by Johnny's Selected Seeds and Peaceful Valley Farm and Garden Supply. The hardest part of harvesting is separating the grain from the chaff. That's why we were excited to see the Sylvan Foot-Powered Thresher demonstration at the MOTHER EARTH NEWS FAIR in Asheville, N.C., back in April.

Sharon Howard, the owner of Sylvan, told us she was so frustrated by not being able to find a tool to help her thresh wheat that she tracked down one made overseas, and now she's importing it. The unit threshes rice and beans, too, and sells for $595 plus shipping. View a video of this thresher in action at *www.SylvanTec.com*.

If you're more inclined to take a DIY approach, browse the numerous videos on YouTube showing creative homemade thresher setups, including one that uses an electric drill to spin a short chain inside a 5-gallon bucket—details at *http://goo.gl/eCbNtb*.

Better threshing is afoot with this innovative, small-scale grain processor now available in the United States.

Another excellent homestead tool, the new Avalon Cider Press, debuted at the FAIR in Puyallup, Wash., in May 2014. This is one serious cider-making machine: The industrial-style, stainless steel grinder can produce up to 400 gallons of fresh apple juice per day! Its baskets and fruit pan are stainless steel, too, and the unit is made in the United States. Go to *www.MeadowCreature.com/Avalon* for more info.

The simple-to-operate, portable grain thresher and the heavy-duty cider press would each make a great homestead tool to share among several families, or to rent to neighbors, to offset the initial purchase price.

—Cheryl Long, Editor-in-Chief

SHARON HOWARD; TOP: FOTOLIA/DANI VINCEK

Go, Vermont!

Vermont may be one of the smallest states in the Union, but that hasn't stopped it from tackling some of the biggest challenges facing our nation today. Here's a highlight reel of some of the Green Mountain State's forward-thinking initiatives.

Workers' rights. Amidst a national trend of outsourcing and cutbacks, Vermont Sens. Bernie Sanders and Patrick Leahy have introduced two bills that would encourage the creation of worker-owned cooperatives nationwide. According to its sponsors, this business model would give employees control over wages and whether their jobs get outsourced, fostering economic equality and laying the groundwork for a strong middle class. Under one of the bills, the U.S. Department of Labor would help states fund centers for training and supporting worker-owners. The other would establish a U.S. Employee Ownership Bank to help workers purchase businesses through stock ownership plans or worker-owned co-ops. Learn more at *http://goo.gl/AU3Caq*.

Resource overconsumption. Since 2005, the nonprofit group Vermonters for a Sustainable Population (VSP) has been advocating for Vermont residents to live within the limits of the area's resources. In a groundbreaking report released this year, VSP drew on expert analysis in areas ranging from biodiversity to economic stability to propose an optimal population for the state: 500,000. Getting there from the current population of 626,000 will take some careful planning. VSP's suggestions include offering free contraception, limiting income-tax exemptions to two children, and factoring quality of life into measures of economic progress. See *www.VSPop.org* for more.

Food rules. In the ongoing battle over the right to know what we're eating, Vermont became the first state to pass a no-strings-attached GMO-labeling law earlier this year. Because neighboring states are likely to follow suit, the move could have a big influence on labeling nationwide. A group of corporations filed a lawsuit against Vermont in June, reports the Burlington Free Press, calling the law "a costly and misguided measure." The group of plaintiffs, headed by the Grocery Manufacturers Association, also includes the Snack Food Association, the International Dairy Foods Association and the National Association of Manufacturers. Vermont Attorney General William Sorrell says he is ready to "zealously defend the law."

—Suzanne Lindgren

Governor Peter Shumlin signs Vermont's GMO-labeling bill into law.

260-MPG Car

What first stands out about the new Volkswagen XL1 is the diesel plug-in hybrid's stratospheric fuel efficiency—a combined 260 miles per gallon equivalent (MPGe) under ideal conditions. But equally noteworthy is the car's long list of design innovations. Touted as "the world's most fuel-efficient car" by its manufacturer, the two-seater packs a small diesel engine and an electric motor inside a highly aerodynamic design. The teardrop-shaped body clears the pavement by only 2 inches and is made from lightweight, carbon-fiber-reinforced plastic (with an underlying crash structure for safety). Cameras have replaced the exterior mirrors to reduce drag. Even the body paint weighs substantially less than normal. The total weight of the car is only 1,750 pounds, which, for comparison, is 1,000 pounds less than the 2014 two-door Honda Civic. Only about 200 XL1s have rolled off the Volkswagen production line to date, and sales are limited to Europe. While the XL1's estimated $167,000 price tag makes it inaccessible for most drivers, its impressive design elements will likely boost the mpg of less expensive cars in the future.

—Rebecca Martin

New Seed Marketplace

Gardeners now have a new online marketplace for buying organic seeds. Launched in May 2014 by co-founders Luke Callahan and Ryder Ross, SeedWise is the first platform that connects multiple small-scale organic seed growers directly with consumers. The innovative website is based on a farmers market model, in which customers can browse the offerings of a diversity of producers. Many seed growers find it incredibly difficult to make a living by selling seeds wholesale to larger seed companies, Callahan says, so SeedWise wanted to give growers an accessible avenue for finding retail customers and receiving fair compensation for their work. He says the team also wanted to foster transparency: "We believe that organic farmers and gardeners deserve to know where their seed comes from. They deserve to know who grew it, where it was grown, and what practices were used to keep each variety strong. We're providing some of the accountability that is so needed in the seed industry." Right now, you can browse the offerings of about 20 farms on SeedWise, and the website is growing every week. Go to *www.SeedWise.com* to shop for seeds—or, if you're a small-scale seed grower, to get details on setting up a farmer profile and listing your varieties for sale.

—Shelley Stonebrook

Neat Meat News

One of the biggest barriers to supporting and expanding local, safe and more humane meat production is the lack of sufficient meat-processing plants. Plus, the stringent regulations that govern meat processing can be prohibitive for small-scale operations. Enter the Niche Meat Processor Assistance Network. Its mission is "to provide a network and info hub for people and organizations who want small meat processors to thrive." The group offers tools and information for small-scale processors as well as the farmers, marketers and meat buyers who depend on them. Be sure to check the network out online at *www.NicheMeatProcessing.org*.

—Cheryl Long, Editor-in-Chief

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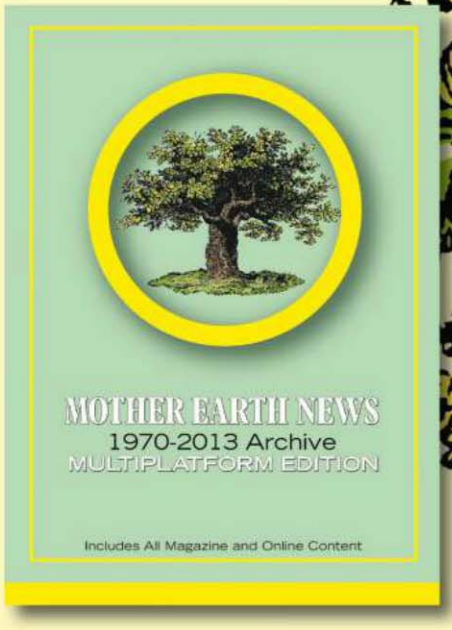

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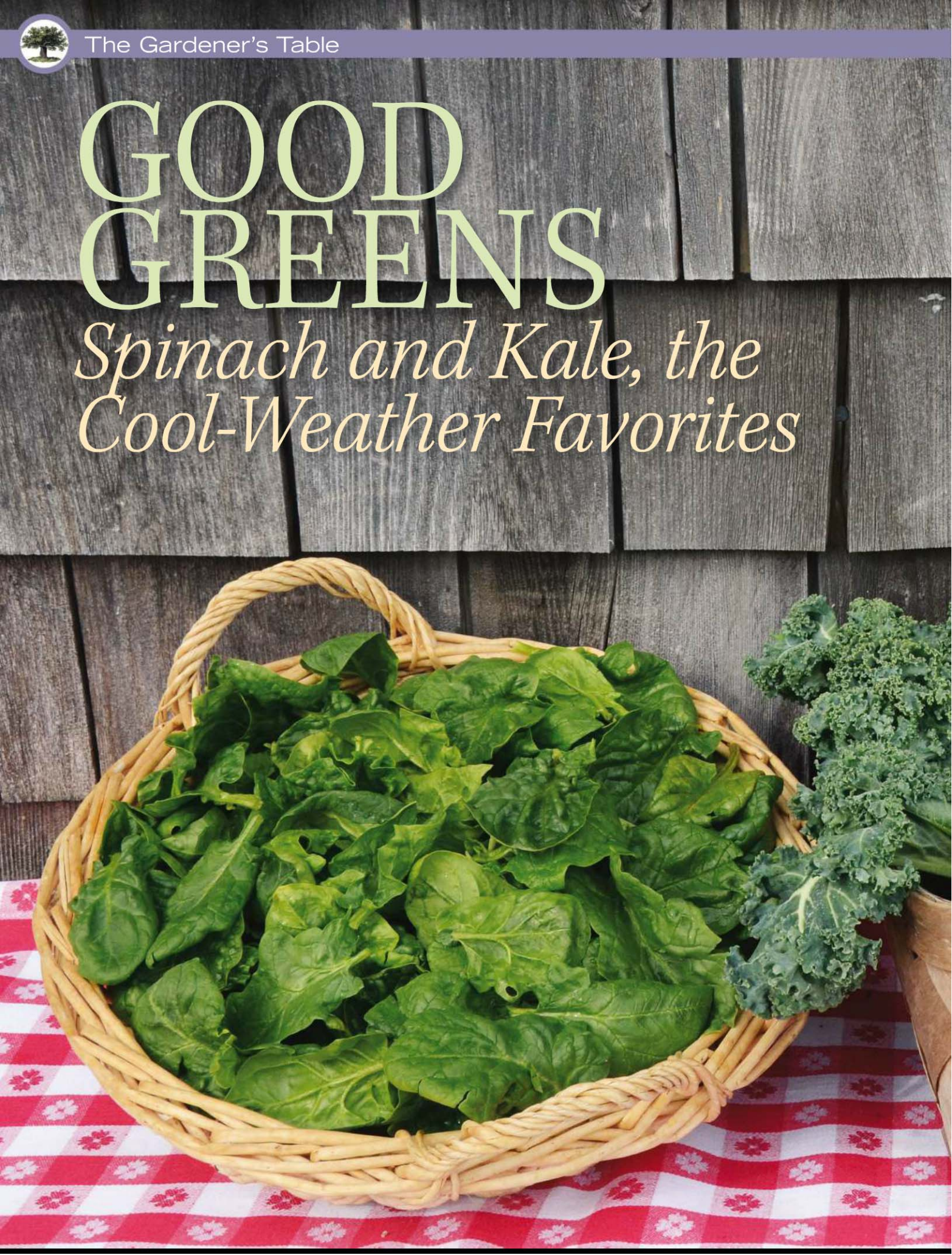
GOOD GREENS

Spinach and Kale, the Cool-Weather Favorites



Grow these stalwart stars of the fall garden, and then try this trio of easy recipes to make them shine at your table, too.

Story and photos
by Barbara Damrosch

Leaves may be falling from the trees now, but if you've planned well, abundant fresh ones currently color your garden green. Leafy green vegetables love fall, and their flavor improves in cooler weather — especially if grown without synthetic, high-nitrogen fertilizers. For kale and spinach, whose sugar content rises as the temperature falls, this is the best season of the year.

Our approach to greens has changed since the days of long boiling in a pot, the obligatory dab of creamed spinach next to a steak, and the generic iceberg lettuce salad. You can grow many different kinds of greens in your garden, and the distinction between salad greens and cooking greens has all but vanished as cooks gain finesse and become attuned to the flavors and textures of this nutritious fare.

Growing Kale and Spinach

Sow kale and spinach as late in summer as you can get away with, typically in late July or August, so they reach maturity before a hard frost. Both will tolerate a freeze, but their growth will slow, even with the cold-tolerant spinach varieties, such as 'Space' and 'Winter Bloomsdale,' and the hardiest kales, such as 'Winterbor.' Even more indomitable are the stemless kales, such as 'Dwarf Siberian,' which hunker down for warmth rather than

Cut spinach leaf by leaf, taking just a few leaves from each plant to keep the crop producing. Keep beds tidy.

growing tall. (For more detailed guidance on which varieties to choose, see "Winter Gardening Tips: Best Winter Crops and Cold-Hardy Varieties" at *http://goo.gl/4WcqRb*.)

Both greens will bolt when spring comes, but by then you may have a new crop of each coming along. In areas with harsh summers, both kale and spinach will take a break during the hottest months, but here on the cool Maine coast, we can eat them year-round. We have three methods of protecting both crops in winter: growing in a cold frame, growing beneath quick hoops (also known as low tunnels) covered with plastic or fabric row cover, or growing under a layer of row cover inside a small, simple plastic greenhouse. In mild regions, you may be able to get away with a covering of hay or straw — or nothing at all. (You'll find more guidance for growing kale and spinach in our Crops at a Glance Guide at *http://goo.gl/JeFdF2*.)

Harvesting Leafy Greens

Kale's large, upright leaves make cutting it a snap, while harvesting spinach takes a little longer. Try picking spinach with a small, sharp knife in one hand as your other hand collects cut leaves and drops them into a nearby bucket or basket. Note how both plants keep growing by sending up small new leaves from the center. The more regularly you pick, the more new leaves they will produce. Cut large leaves for cooking, smaller ones for salads. Always leave at least a few leaves on the plant so it can continue

Colcannon, a Traditional Irish Comfort Food

Sometimes the simplest, most economical dishes are the most satisfying. Colcannon is one from Ireland, for which all you need is cabbage or kale, some potatoes, and the dairy element that gives it richness and makes meat unnecessary. You can substitute milk for the cream in this recipe, but don't leave out the butter — even if you pass the butter at the table so diners can choose the quantity, melting it into their portion while the colcannon is steaming hot. I leave potatoes unpeeled, both for the skins' nutrients and for the texture they give to the dish. Many variations of colcannon exist — in parts of Scotland, it's called "Rumpledethumps" and made with cabbage. Popular additions to colcannon include sautéed leeks and bacon. *Yield: 4 to 6 servings.*

2 pounds unpeeled potatoes, cut into chunks
6 small to medium kale leaves
1/2 cup whipping cream
Coarse sea salt, to taste
Freshly ground black pepper, to taste
1/4 cup butter (half a stick)

Drop the potatoes into a medium saucepan of boiling water. Lower the heat and simmer them until tender, 15 to 20 minutes, then drain.

While the potatoes are cooking, cut or tear the ribs off the kale and discard them. Chop the leaves coarsely. You should have about 2 cups, tightly packed. Steam the kale until tender, 10 to 15 minutes. A firm, curly kale will take a bit longer than a thin-leaved type.

Return the potatoes to the saucepan along with the cream. Mash over low heat with a potato masher until smooth and heated through. Stir in the kale, salt and pepper, and then transfer to a serving bowl. Melt the butter in a small saucepan and pour it over the colcannon. Add an extra grinding of pepper and serve immediately, while still piping hot.

Buttery mashed potatoes with kale and cream make a perennial crowd-pleaser.

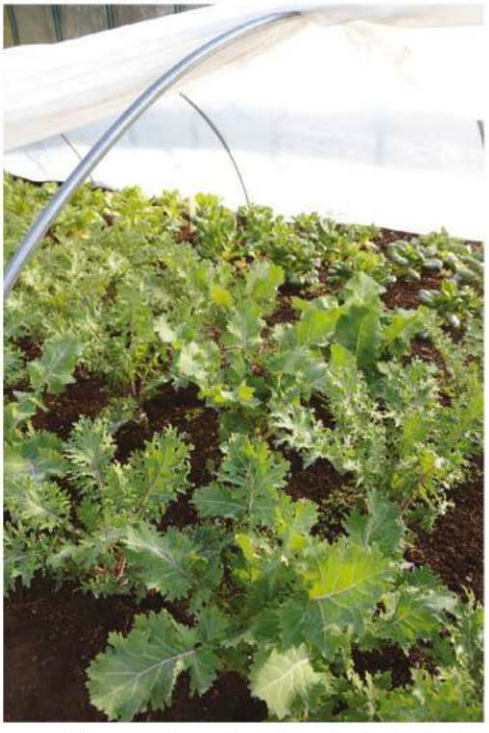
to grow. You must also keep the beds tidy, not only by weeding but also by removing any yellowed or otherwise unusable leaves, as well as any long stems left after picking. This keeps the plants healthier, nicer to look at and easier to harvest.

Blessed with a year-round supply of both of these crops, I don't bother to freeze either of them. (If you'd like to freeze greens, blanch the leaves in boiling water, then cool quickly and pack into plastic bags.) I have experimented with cutting the tops off outdoor kale plants and storing them in a black plastic bag in the toolshed adjacent to our house, where the kale freezes, but not completely. The kale will often keep that way for a few months, fresh and handy to use in the kitchen.

Cooking Greens: Into the Pot

Spinach has long been popular, but kale is now giving it a run for its money. I've often heard kale hailed as "the new spinach." Lured by kale's reputation as a superfood, people who try it have found that it's easy to grow, easy to cook and just plain tastes good. As a gateway recipe, try tossing fresh, chopped kale leaves into a pan of drippings left over from frying sausage, pork chops or bacon. Sweat them, covered, with a bit of water and crushed garlic, and then scrape the pan to mix in any crisp, meaty bits. See what I mean? Delicious.

Because of kale's robust texture, you can drop pieces into a soup and they won't quite lose their shape. Knowing this, you'll find yourself stirring them into pork and beans, succotash, scalloped potatoes, and a host of other favorites, turning these foods into nutritious one-pot meals. This trait may also explain the surprising popularity of kale salads, as the leaves can support the heaviness of thick dressings, warm



Use quick hoops to make a simple shelter to protect and grow greens all winter.

Crispy Kale

Known as "kale chips" to most, this dish has become wildly fashionable and may be a major cause of kale's recent surge in popularity. For families eager to embrace healthful snack foods without giving up the magic trio of salt, fat and crispness, it's just the thing, and I find a plate of it set out for the grandkids disappears just as fast as you can say "potato chip." Slow cooking at a low temperature allows the kale chips to become crisp without browning. You can add many things to crispy kale, such as garlic or cheese, but I like this simple version best.

Yield: Enough to mound on a large dinner plate, about 4 ounces.

1 bunch kale (about 8 stems, or 1/4 pound)
2 tbsp olive oil
Generous pinch of coarse sea salt

Preheat the oven to 225 degrees Fahrenheit. Pull the green part of the kale off the ribs in roughly 2-inch pieces. Discard the ribs, or save for another use. From here, one method is to toss the kale and olive oil in a large bowl with your hands, massaging the leaves a bit to soften them if they're extra-firm, and then baking them on a cookie sheet. But I have had even better luck just smearing the cookie sheet with the oil and placing the leaves on it. This distributes the oil uniformly. Spread the leaves in just 1 layer, using 2 sheets. I bake curly kale for about 12 minutes, flip the leaves over with a spatula, and bake 4 minutes more. Thin-leaved Tuscan types or the 'Red Russian' variety take a bit less time, and there's no need to flip them.

Serve right away, or leave out for nibblers who wander by. Chips will keep—and stay crisp—for several days at room temperature.

Kale chips satisfy the desire for a snack with the "magic trio"—salt, fat and crunch.

additions such as bacon or honey, or hefty croutons that would flatten, say, a bowl of baby arugula. (The mimosa dressing recommended below for spinach would also be great with kale.)

For eating raw, I prefer the thinner-leaved types of these greens, such as Tuscan kale (also called "cavolo nero," "lacinato" or "dinosaur kale"), or Northern varieties, such as 'Red Russian.' To prepare kale for any use, remove the tough central ribs, either by pulling off the soft part or by folding a leaf and slicing alongside its rib with a knife. Discarding the stem is by no means a requirement, however. Some worshippers of plant fiber slow-roast the ribs with olive oil and garlic and swear they are divine.

Anything you can do with kale you can do with spinach — and more. Spinach's slightly milder flavor lends itself to creamy dishes, such as quiches, purées and smoothies. But it's hard to beat just plain spinach, lightly steamed or dropped — just after washing, while moisture still clings to the leaves — into a pan slicked with butter or oil, and then stirred until barely wilted. For variety, add pine nuts, raisins, and a dash of cream or sherry. To preserve as much as possible of the greens' vitamin-rich juices, which are loaded with chlorophyll, don't overcook spinach. You can stockpile any cooking liquid for soups, but better not to lose it in the first place.

I remove the ribs of large spinach leaves only if they will be served raw, or if I want a purée that is as dense and deep green as a spruce forest.

Barbara Damrosch creates fresh recipes using the bounty of her garden with her husband, Eliot Coleman, at Four Season Farm in Harborside, Maine. She is the author of *The Garden Primer* and, with Coleman, of *The Four Season Farm Gardener's Cookbook*. Both are available on Page 64.

Spinach Salad With Mimosa Dressing

This salad provides enough protein to be a meal in itself. We love it as a light supper in fall, after cooler days and nights have sweetened the spinach in the garden. The grated egg yolk sprinkled on top evokes the bright yellow pollen from the flowers of the mimosa tree. *Yield: 4 servings as a side dish, 2 as a one-dish meal.*

3 large eggs
2 tbsp butter
2 cups cubed whole-grain bread
1/8 tsp dried thyme
1/4 pound slab or thick-cut bacon, cut into 1/4-inch cubes
1 tbsp vinegar
4 tbsp olive oil
1/4 pound small spinach leaves, washed and spun dry
Coarse sea salt, to taste
Freshly ground black pepper, to taste

Hard-boil the eggs according to your favorite method, then set the cooked eggs aside to cool.

In a medium skillet, melt butter over medium heat. Add bread cubes and sprinkle with thyme. Stirring continuously, toss to coat the cubes with butter, and brown slightly on all sides. When crisp, set them aside in a bowl to cool to room temperature. In the same skillet, fry bacon cubes over medium-high heat, stirring, until brown and crisp. Set aside to cool.

Peel the eggs and cut in half, and then remove yolks and reserve. Chop the whites fine and set aside in a bowl. Holding a fine grater or Microplane horizontally over another bowl, grate the yolks. Set bowl aside.

To make the mimosa dressing, whisk the vinegar and oil together. Place the spinach in a wide, shallow salad bowl with room for tossing. Add the dressing, salt and pepper, and then toss gently but thoroughly. Sprinkle the bacon evenly over the top of the salad, followed by the egg whites and finally the yolks.

As people help themselves to the salad, the ingredients will distribute among the spinach leaves.

Finely grated egg yolk lends the sunny color of mimosa tree pollen to this hearty main-dish salad.

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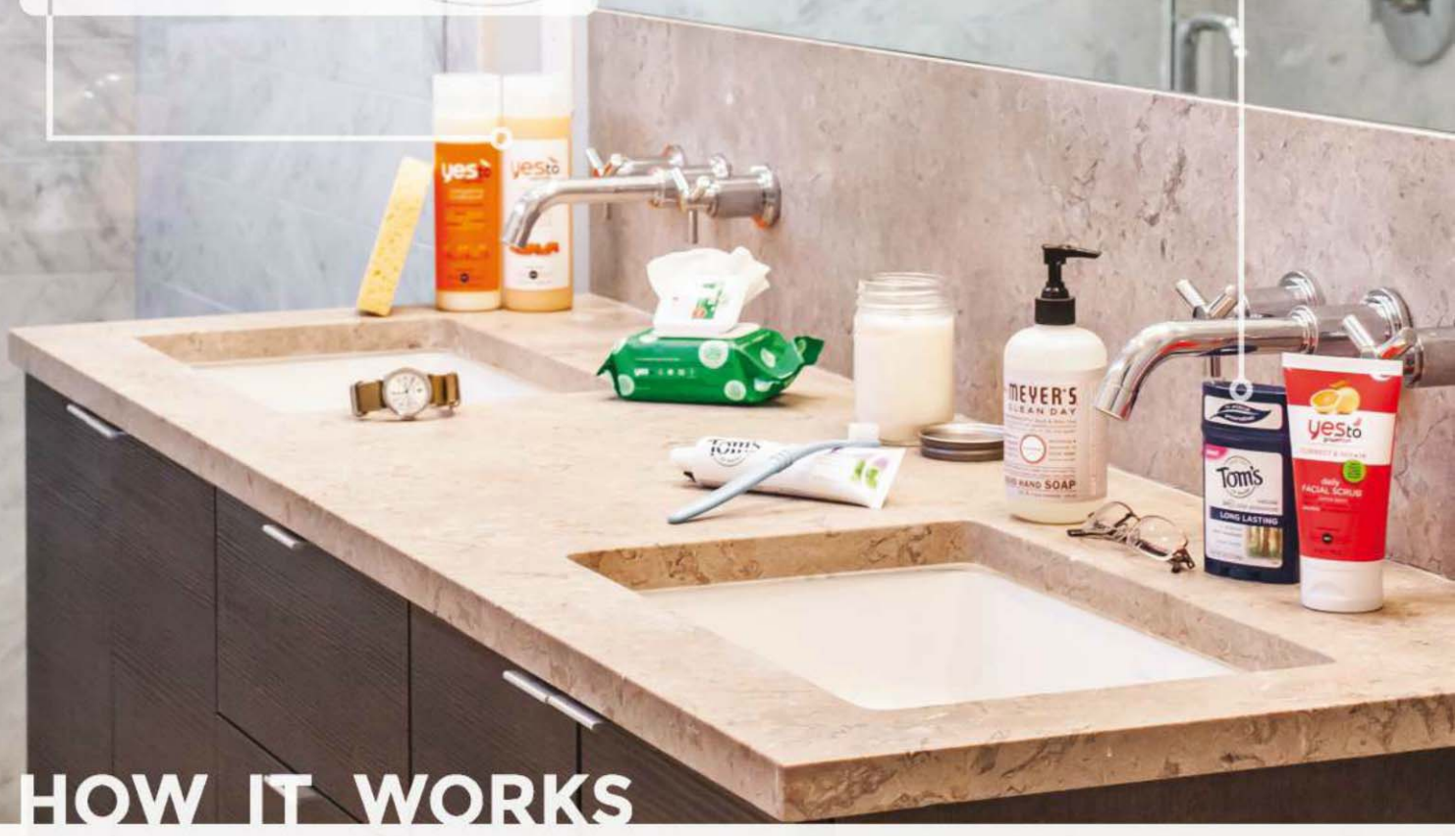

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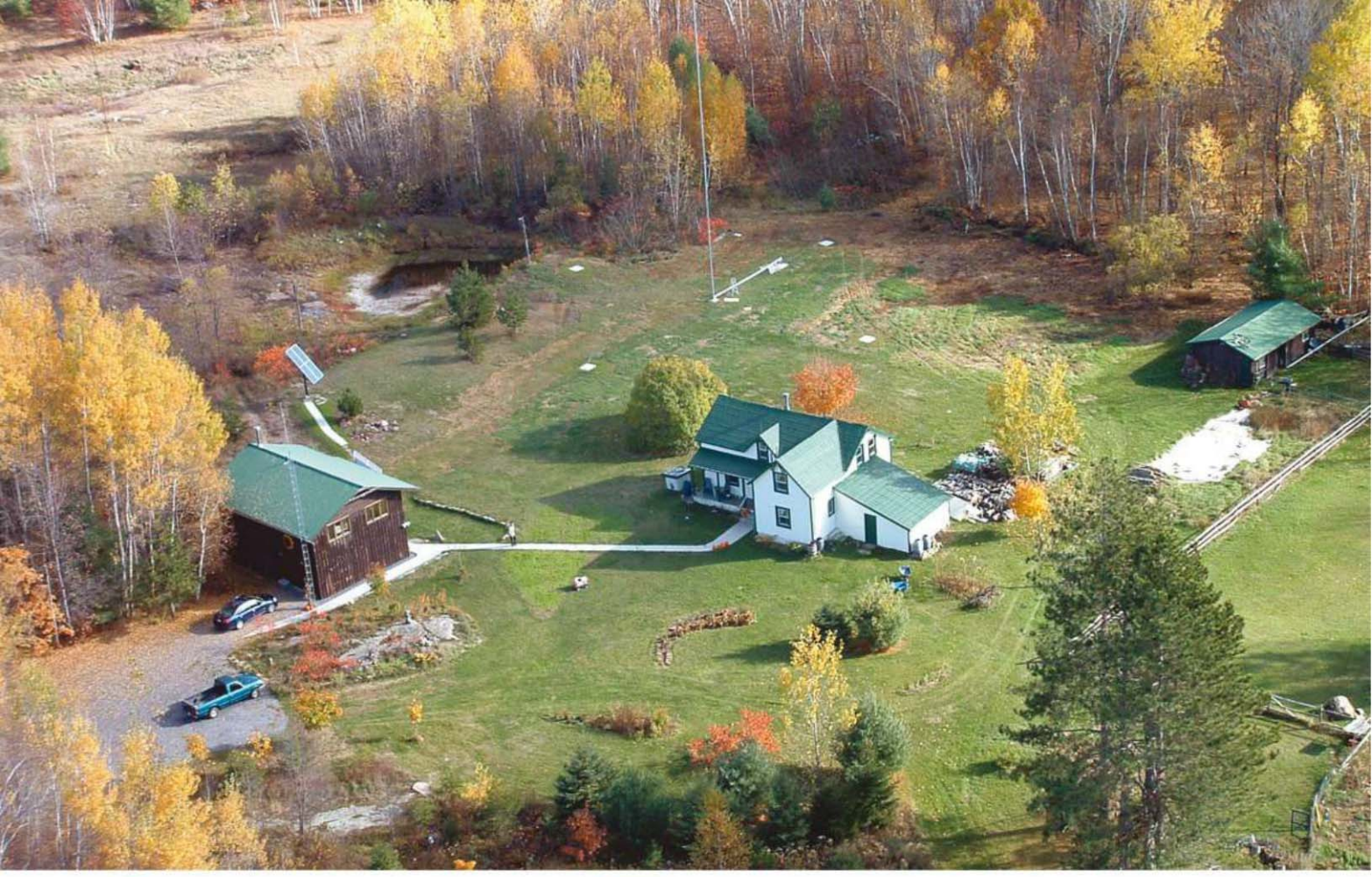


Lessons From OFF-GRID LIVING

Follow this advice from a 20-year veteran homesteader to shift to a low-carbon lifestyle.

By Cam Mather

Both idealistic and practical reasons led my wife Michelle and me to choose off-grid living 20 years ago. After a five-year search for rural property, we found 150 acres in the woods of eastern Ontario and struck out in 1998 to build our farm and homestead.

We suffered major sticker shock when our local utility quoted us $100,000 to connect to the electricity grid. Today, we'd be looking at closer to $200,000 to connect. Especially with today's lower prices for renewable energy and advancements in technology, if I were starting over, I'd still happily make the choice to go off-grid.

Untethered Solar Power

When Michelle and I purchased our 1888 farmhouse, it was powered by eight 60-watt solar panels. We added four 75-watt panels, which were $750 each, or $10 per watt. The following year, we replaced our propane fridge with an electric model and added another four panels. (Today, those panels would cost us one-tenth of what we paid, because the cost has plummeted to about $1 per watt!) My neighbor helped me build and weld my own solar tracker, which allows our solar array to follow the trajectory of the sun across the sky. While solar trackers aren't necessary, they've increased the energy output of our system by about 20 percent.

Several years later, we were offered four 175-watt panels at an excellent price, so I went to work building another solar tracker. For each solar panel we add to our array, life gets noticeably easier because we can use appliances that might have been too energy-intensive for our previous setup. Each addition also allows us to reduce our reliance on propane, which supplements our energy for cooking and heating water. Our arrays now hold 2,300 watts' worth of solar panels, which is more than sufficient to run a

ALL PHOTOS: CAM AND MICHELLE MATHER

The Mathers power their 150-acre homestead (opposite) with diverse renewable energy sources, including solar panels and wood they cut on site.

refrigerator, a freezer, two laptop computers, an LCD television and DVD player, satellite TV and Internet, a washing machine, and a kitchen fully stocked with appliances. We get by without air conditioning, which would be a major energy hog. (See "Daily Energy Consumption on the Mather Homestead," below, for a breakdown of our appliances' energy use.)

Lesson: Purchase additional solar panels as soon as you can afford them. In hindsight, I wish we'd had the money to purchase more photovoltaic panels sooner. Each additional solar panel has made off-grid living more comfortable—ah, the simple joy of a toaster!—and has given us more confidence to use less propane and more solar-powered electricity for our cooking and baking.

Our Battery Storage

You can install grid-tied solar panels without batteries, but to be off-grid, you'll need batteries to store power for use at night. We replaced our system's existing nickel-cadmium battery bank that was at the end of its life with $4,000 worth of large, deep-cycle, lead-acid batteries. The batteries are the only part of our electrical system that requires regular attention. I monitor the batteries' state of charge and periodically add distilled water to them. You'll need to ensure that your batteries never fall below 50 percent of their charge. Never paying an electricity bill or experiencing a power outage is more than enough compensation for the time I spend to maintain our batteries.

Lesson: Don't undersize battery banks in off-grid installations. With today's low PV panel prices, strive to oversize both your solar array and your battery bank. You'll worry less about maintaining your electricity system, and you'll run your generator less often.

Daily Energy Consumption on the Mather Homestead

Our total daily energy consumption is 5,025 watt-hours, or about 5 kilowatt-hours. Compare this with the average U.S. home's 30 kilowatt-hours per day. We have enough battery storage capacity to run our household for approximately three days if no sun or wind can power our systems.

Refrigerator	1,000 watt-hours
Freezer	1,000 watt-hours
Lights	500 watt-hours
Washing machine	1,000 watt-hours (4 loads per week)
Water pump	250 watt-hours (1,000 watts for 1/4 hr)
Two laptops	560 watt-hours (20 watts each for 14 hrs)
Satellite Internet dish	280 watt-hours (20 watts for 14 hrs)
Radio	105 watt-hours (15 watts for 7 hrs)
Television	330 watt-hours (110 watts for 3 hrs)

Wind Complements Solar

When we moved here, a broken wind turbine on a 60-foot tower sat on the property. (Turbines are mechanical entities that operate in extremely unforgiving conditions and, therefore, have a tendency to break.) I ultimately replaced the unit with a 1-kilowatt Bergey wind turbine on a 100-foot tilt-up tower. That was a huge undertaking for me, but I couldn't find a dealer willing to do the installation. The effort to install and maintain the turbine has proved worthwhile, however, because wind picks up the slack when solar conditions aren't ideal.

Lesson: Diversify your energy sources. Renewable energy sources can complement each other. Before we erected our wind turbine, we ran our backup propane generator 12 to 15 times per year. By investing in a hybrid solar/wind system, we've reduced the frequency of our generator use to just five or six times each year, mostly during the dark days of fall and early winter, when there is neither enough sun nor wind to keep our batteries charged.

Lesson: Consider wind turbine siting. To get the most out of a wind turbine, try to locate it in an open area or near a body of water. Ideally, your wind turbine should be 300 feet from barns, silos and tree lines, and at least 30 feet taller than objects that may cause turbulence. Our tree line is about 60 feet tall, our tower is 100 feet high, and we are surrounded by a forest, so while we don't have the ideal setting, our wind power output is satisfactory, especially during November and December (our cloudiest, windiest months).

Lesson: Plan for surprises and prepare for emergencies. We went to great lengths to carefully ground and protect our wind turbine and tower from lightning, but despite

our efforts, a bolt struck them in the summer of 2013. The broken DC rectifier was relatively inexpensive to replace, but we did have to lower the tower, which was a stressful experience. The takeaway? You'll be faced with emergencies, but a diversified mix of energy sources will create a more secure off-grid setup that can weather any crisis.

Sustainable Wood Heat

Conventional grid-tied homes using fossil fuels produce about 60 percent of their carbon emissions from heating. In contrast, we heat our home with a highly efficient Pacific Energy non-catalytic woodstove and cut all of our firewood on our land. Heating with wood from our well-managed woodlot is carbon-neutral, because new growth will recapture the amount of carbon released from the trees we cut.

Lesson: Choose electric tools and power them with renewable energy. I cut more than half of our firewood with a corded electric Yardworks chainsaw run on renewable energy. To further reduce our use of gasoline, I acquired an Oregon 40-volt, battery-powered chainsaw to cut trees in the bush. I then pull the logs back to the house, where I buck the lengths into firewood with my corded chainsaw. In my younger days, I split all of our wood with an axe, but last year I purchased a Yardworks 4-ton electric log splitter, and I continue to be amazed by what it can split, as many typical gas-powered models are 28-ton. Electric equipment is rugged: I used my electric Poulan chainsaw for a decade and only replaced it when a newer model had some features I wanted to try.

From top: Cam commutes on an electric bike, stores potatoes in sand for winter, and gathers produce for the farm's CSA program.

Multiple Methods to Heat Water

Five years ago, we added a solar hot water heater. I welded the system's frame, which sits on the roof of our back porch, and I did the plumbing myself. Tapping the sun's energy to heat water is much more efficient than using it to generate electricity. We have two tanks for hot water: a 60-gallon tank for the solar hot water heater and a 40-gallon tank for a diversion load from our solar electric system. During sunny periods when I know my batteries are fully charged, I can manually divert excess electricity to the heating element in the hot water tank by throwing a switch (which I turn off as the sun starts to go down). Six to eight hours of full sunlight will usually heat both tanks. Feeling how hot our water is after a sunny day is magical.

Lesson: Vary the ways you heat water. About 60 percent of our hot water comes from our solar hot water system. During cloudy days in late fall and early winter, neither of our systems produces enough hot water for us, so we rely on our woodstove. We always have large kettles of water on the woodstove to keep about 10 gallons of hot water on demand. During winter, we fill large stockpots with water and heat them up on our woodstove for baths. We bathe in a cast-iron claw-foot tub that absorbs the water's heat and radiates it back into the bathroom throughout the night.

Smart Food Storage

We eventually worked up the nerve to purchase a freezer to store some of the bounty from our garden. We've reduced the freezer's run time by putting it in our unheated basement, which stays at about 32 degrees Fahrenheit during winter. We've mastered growing vegetables that store well, such as carrots, onions, potatoes, squash and sweet potatoes. During summer, we run a community-supported agriculture (CSA) program and supply 50 families with a weekly box of vegetables from our garden.

Lesson: Upgrade to energy-efficient appliances. Thanks to improved energy-efficiency standards, a large modern fridge is much

more efficient than a small older unit, so we upgraded to a new model.

Lesson: Build a root cellar for electricity-free food storage. We have a cistern below our kitchen, which we use as a root cellar. The cistern is cool but never freezes, and it has a high level of humidity, which is optimal for storing our garden vegetables. We put up a significant portion of staple crops this way and continue to experiment to find vegetable varieties that keep well.

You can enjoy a more secure and sustainable, off-grid lifestyle for less cost and hassle than ever before.

Well Water and Water Pumps

We supplement water from our 50-foot-deep drilled well with water from a shallower dug well near our main garden. We use a small, solar-powered DC pump to fill up rain barrels. The solar pump also runs a drip irrigation system that we move throughout the gardens as needed.

Lesson: Pump your water in large batches. Pumping water requires a lot of power, and the biggest surge occurs when the pump first clicks on, so filling two water tanks at a time makes sense. Our cistern contains two 30-gallon water tanks that are pressurized by the deep-well pump in our drilled well.

Carbon-Free Transportation

When folks move to an off-grid, rural homestead, they often end up burning a lot of fossil fuels (and spending a lot of money) driving to and from town in an inefficient farm truck. You may want to ride a bicycle, but time, long distances, considerable physical strain and the amount of cargo you'll need to haul will be limiting factors. Electric cars are becoming more available, but they're still quite expensive.

Lesson: Go electric on two wheels. We have an electric bicycle with a lithium battery that charges in about three hours when connected to solar power. This marvelous machine allows me to ride the 8 miles to town without having to pedal the entire way. While I can't haul loads that weigh more than about 50 pounds, I've made many trips with a good amount in tow.

Today, off-grid living is no longer a huge ordeal. We've had many challenges over our 20 years, but times have changed—technology is better and more affordable, and you can easily find information to master whatever off-grid skills you need. Size your energy systems properly and be mindful of checking your batteries regularly, and you can say goodbye to increasing utility bills and frequent blackouts that accompany extreme weather events. You, too, can enjoy a more secure and sustainable, grid-free lifestyle.

Cam Mather homesteads on 150 wooded acres in Ontario, where he and his wife, Michelle, run a 50-member CSA program and a publishing business, all powered by sun and wind. Go to Page 64 to order his books *Little House Off the Grid* and *Thriving During Challenging Times*, available at a discount until Nov. 31, 2014.

You can enjoy fresh pea shoots in salads throughout winter, all the way to asparagus season.

SALADS ALL WINTER?

You Bet, With This Crop

Austrian winter peas will give you tender, delicious greens even in sub-zero weather, plus build your soil and provide nectar for bees in spring.

Story and photos by Cheryl Long, Editor-in-Chief

Gardeners love to try new things, but it's not often we stumble upon something truly "new." For me, that happened a few years ago, when I discovered that the shoots from a winter cover crop I was growing were an excellent salad green. These super-cold-hardy Austrian winter peas deserve a place on every gardener's winter "must grow" list.

First, the shoots are delicious. Whenever I ask friends to taste them, their surprised response is, "Wow! The shoots taste just like actual peas!" Everything I've spotted online about these peas refers to using them as a cover crop, but almost no sources mention that they also make a superb winter salad green. I did find one website that said, "the young foliage tastes of green pea and can be quite good, but the plant isn't normally grown as food." And a blogger on the Richmond

Even in midwinter, Austrian winter peas stay green and healthy, ready to harvest.

Food Collective recommended adding the "yummy pea tips" to winter salads.

What makes these peas so special is that they're especially cold-hardy. As with spinach and kale, you can plant Austrian winter peas in late summer or fall, and then harvest the shoots for as long as eight months in many regions (October to May) before the peas flower and go to seed in spring. Several sources say Austrian winter peas can survive cold down to 10 degrees Fahrenheit. I can report that with a simple row cover or frost blanket, these peas can even tolerate extended periods of below-zero weather here in my eastern Kansas Zone 6 climate, where we get lots of wind and not much snow cover. I plant them in fall in time for them to grow 8 to 12 inches high before freezing temperatures arrive, and the peas overwinter just fine with no protection most years. Last winter was an especially cold one, yet I continued to harvest Austrian winter peas, along with kale and spinach, for terrific fresh, green salads right through the cold snaps.

> Sow winter peas six to eight weeks before your average first fall frost date.

Winter Peas' Benefits

Here are six additional reasons to try these wonderful, under-appreciated winter peas:

They add nitrogen. Peas are legumes and that means they will fix nitrogen in your garden soil, necessary for rapid growth and plant health, if the proper bacterial inoculant is present in the soil. When I check the roots of my summer peas and beans for the nodules that are formed by nitrogen-fixing bacteria, I usually don't find them, even if I inoculated the seeds before planting. But on the roots of my Austrian winter peas, I always find extensive nodules. Now when I plant my winter peas each fall, I scatter a few shovelfuls of soil from last year's pea bed to provide the inoculant for the new crop. (Don't do this if you've had any sign of root rot on your peas.)

They support beneficial soil fungi. As we explain in our article "Mycorrhizal Fungi: The Amazing Underground Secret to a Better Garden" (read it at *http://goo.gl/mBRn9M*), it's a good idea to keep live plants growing in your beds during winter, as they'll support the mycorrhizal fungi that help plant roots take up essential nutrients, thus ensuring a robust harvest. Winter peas are a perfect crop for this purpose.

They're easy to plant and quick to harvest. Sow the peas in early fall, and you can begin harvesting as soon as the shoots are 6 to 8 inches high. In spring, the plants are easy to remove.

They provide flowers for nectar and beauty. Winter peas flower in spring, producing masses of small pink blossoms that are a good nectar source for bees. When planted next to a trellis (I use a stock panel), winter peas will climb and make a lovely flower display. Mine grow more than 5 feet high.

They're easy to manage. The peas kick into high gear as soon as temperatures move into the 40s and 50s in early spring. After

A patch of Austrian winter peas will fix nitrogen in your garden soil.

Try the shoots of winter peas combined with free-range eggs in an omelet (left). Winter pea flowers offer both beauty and nectar in spring (right).

becoming established, the vines twine together as they grow, providing excellent weed suppression and lots of biomass. The vines are succulent and easier to pull out or cut with a hand sickle than those of many other cover crops. You can use the spent vines as a mat-like mulch, or just toss them into your compost pile.

I prefer to leave the peas in place to continue growing as long as possible in spring. I use the vines as a mulch by pulling out enough plants to open up a row down the middle of the bed, and then pushing the vines down and away from each side of the open row, letting them sprawl over the paths on either side of the bed. That way, the peas can continue growing while they provide a living mulch for the tomato or pepper transplants I set into the open row in the middle of the bed.

Winter peas are great fodder for livestock and poultry. Small ruminants, such as goats and sheep, relish pea shoots. Chickens adore them, too. In the dead of winter, when fresh green fodder is hard to find, an armful of winter pea shoots will be a special treat for your animals.

Deer also love Austrian winter peas, so many hunters plant them in food plots to attract the animals. If your garden isn't fenced and deer are a problem for you, protect your peas with row cover.

Growing and Harvesting Tips

Sow Austrian peas in fall, up until six to eight weeks before your average first fall frost date. In northernmost Zones with severe winters, sow winter peas in very early spring. I loosen the soil with a broadfork or cultivator, then broadcast the seeds thickly (about 2 to 3 inches apart), work them into the soil with a rake, and then water. To assure good soil contact, especially if the soil is dry and you don't plan to water, it may be a better strategy to use a hoe to open rows, sow the seeds an inch deep, and then tamp the soil over them. One source suggests using a half-pound of seed per 1,000 square feet, while others recommend 2 to 5 pounds for the same area.

SOURCES

Peaceful Valley Farm Supply
888-784-1722
www.GrowOrganic.com

Sow True Seed
828-254-0708
www.SowTrueSeed.com

Territorial Seed Co.
800-626-0866
www.TerritorialSeed.com

Seed World
813-283-0267
www.SeedWorldUSA.com

Bountiful Gardens
707-459-6410
www.BountifulGardens.org

Austrian winter peas have shallow roots, which is good because it means they don't deplete deep soil moisture as much as some cover crops. But the shallow roots are also bad, because frost heaving, which thrusts soil upward when ice forms toward the surface, can damage the plant roots if winter temperatures fluctuate too much. Some cover crop manuals suggest interseeding winter peas with longer-rooted winter grains (such as wheat, oats or rye). Adding the grain will help reduce damage by minimizing frost heaving during freeze/thaw cycles, but it will mean the cover crop may not be as easy to kill in spring as a peas-only planting.

If you garden in Zone 6 or colder, a heavyweight row cover, also known as a frost blanket, will help the peas overwinter. I place a tunnel made from 2-by-4-inch welded-wire fencing over the young peas first, to hold the frost blanket above the peas so they can continue to grow on warm days. You could also grow the peas in a low tunnel or cold frame if you have one.

Now comes the best part: All winter long, anytime you need a fresh, sweet, crisp green salad, just sweep off any snow, pull back the blanket and cut handfuls of pea shoots. Head to the kitchen, chop the shoots coarsely and—*voila!*—you have a salad. Use similar methods to grow cold-hardy kale and spinach, and you can enjoy months of super-easy, super-nutritious salads—just what the doctor ordered. These greens are also welcome in stir-fries and other cooked dishes.

For additional information on this versatile crop, see the section on field peas from SARE's *Managing Cover Crops Profitably, Third Edition* (also available as a free PDF download) at *http://goo.gl/CbJTS7*.

If you order seeds now, you'll still have time to grow this easy, multipurpose winter salad cover crop. See "Sources" at left. If you try Austrian winter peas, let us know what you think by emailing us at Letters@MotherEarthNews.com or writing to us (see the "Write to Us!" box on Page 83 for our address).

JUST IN TIME! SEASONAL APPS

www.MotherEarthNews.com/Apps

Learn new ways to fill your larder and fresh ways to stretch your gardening season well into fall and winter. These two apps will help you reach your food self-sufficiency goals even as the days grow shorter and colder.

Can-Do Canning Guide

The newly expanded MOTHER EARTH NEWS *How to Can* app is a free, one-of-a-kind digital resource that provides all the know-how you need to confidently can all types of food. We've now added how-to for safely canning meat and seafood. The *How to Can* app is free and available for Apple and Android devices.

Foolproof Fall and Winter Garden Planner

Fall and winter don't have to mean the end of bountiful, garden-fresh harvests. Our *Grow Planner* app for iPad makes planning your best-ever food garden a breeze no matter the season, but the ZIP-code specific planting dates for hundreds of crops will help you organize and plant your fall and winter crops with ease. You'll create a digital plan of your garden, complete with season-extension devices.

MOTHER EARTH NEWS

Find out more at www.MotherEarthNews.com/Apps or scan the code to the right.

8 GREAT PLACES *You've (Maybe) Never Heard Of*

Throughout the United States, people are creating local food systems, building sustainable communities and planning for a healthy future. Take a look at these eight communities where folks are working to improve life right where they are.

By K.C. Compton

At first glance, the communities we've selected as our 2014 Great Places might not seem to have much in common. Some are large cities, some are suburban and some are so small we had trouble finding census data on them. Some of the areas are surrounded by farmland, and in some you wouldn't see a farm if you drove around all day. The demographics of these eight places are diverse, as are the places' economies.

So what do these places have in common? Each is home to groups of individuals coming up with creative, thoughtful solutions to the concerns that all communities face. Some solutions reach back into our nation's history (the well-organized homesteads and up-to-date Victory Gardens that are springing up all over) and some address challenges humanity has never encountered before (voter initiatives to label genetically modified foods).

Throughout the country, neighbors are realizing that connecting on things we want to have happen, rather than feuding over events of the past, will pave a positive path forward—one that each of our 2014 Great Places is on.

Preserving What Matters

Beaufort, South Carolina. Travel brochures accurately tout Beaufort's sophisticated Southern charm, which is largely the result of the determination of its citizens to care for the fragile

DREAMSTIME/JOHN WOLLWERTH; PAGE 35: BOTTOM LEFT: OREGON SHAKESPEARE FESTIVAL; RIGHT: ASHLAND MAIL TRIBUNE/JAMIE LUSCH

Beaufort is located in South Carolina's Lowcountry, a part of the beautiful, coastal Sea Islands (opposite). Beaufort's annual water festival enlists more than 400 community volunteers (above).

TOP: BEAUFORTPICS.COM

Beaufort, South Carolina

Population: 12,967
Climate: 45" annual avg. precip.; January avg. high: 62° F; July avg. high: 91° F
Median household income: $49,056
Median home price: $245,900

coastal environment that makes this beautiful small town in South Carolina's Lowcountry such a special place.

"Its natural beauty, extensive tidal waters and marshes set it apart," says Reed Armstrong, project manager of the South Coast office of the Coastal Conservation League. "Three times since 2002, voters have overwhelmingly supported preservation of natural areas, wildlife habitat, farmland, and historic and cultural sites."

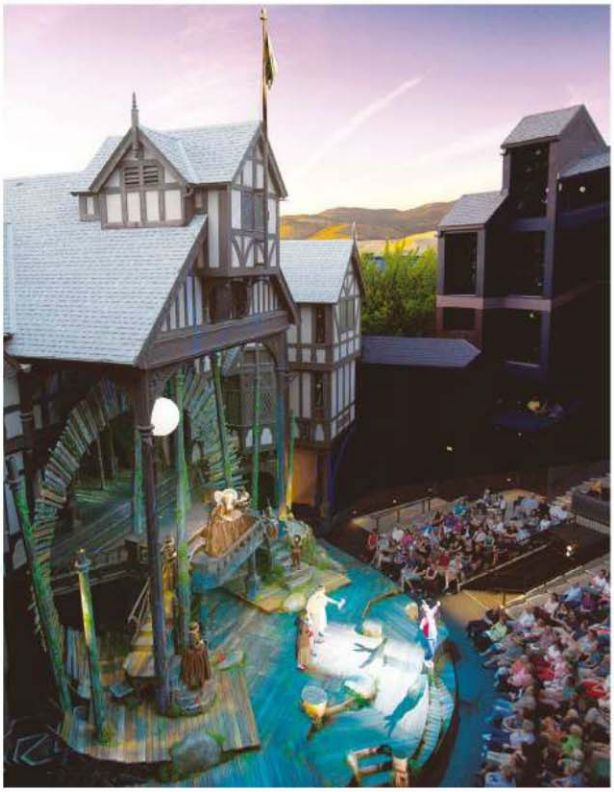
Chartered in 1711, Beaufort is located on Port Royal Island and is South Carolina's second-oldest city. Preservation measures have ensured that the town retains its antebellum architecture, and a number of military installations—including Parris Island, the U.S. Naval Hospital and Marine Corps Air Station—have made the community familiar to thousands who serve in the Armed Forces.

The Waddell Mariculture Center, ACE Basin National Estuarine Research Preserve, Pinckney Island National Wildlife Refuge and Savannah National Wildlife Refuge all provide stewardship programs for the area's water-based wildlife. Joining with the South Carolina Oyster Restoration and Enhancement led by the South Carolina Department of Natural Resources, local residents helped build oyster reefs to strengthen oyster colonies and protect water quality. Organizations such as the Port Royal Sound Foundation, the Master Naturalist Program and Experience Green help educate citizens to protect waters and habitat.

Pathways to Participation

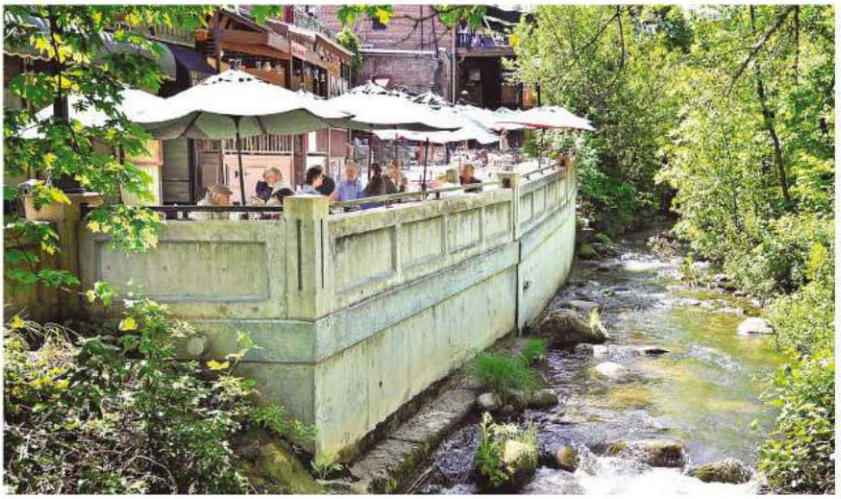
Ashland, Oregon. One of the things 28-year resident Katie Gomez appreciates most about Ashland is the number of volunteer opportunities available, and the variety of people who participate in all aspects of the community. From the Jackson County Master Recycler Program, to bird-watching and nature classes at North Mountain Park, to volunteers who take tickets and usher for theatrical events, Ashland abounds in pathways to participation. ScienceWorks Museum, for example, offers hands-on activities, family science night, camps and even a telescope-lending program.

"I volunteer with three organizations," Gomez says. "I think most folks here volunteer for at least one."



Ashland, Oregon

Population: 20,713
Climate: 20" annual avg. precip.; January avg. high: 50° F; July avg. high: 85° F
Median household income: $43,305
Median home price: $367,700



The Oregon Shakespeare Festival (left) and creek-side dining near downtown (below) are parts of Ashland's charm.

Mention this town in southern Oregon, and the response is likely to be an enthusiastic, "The Oregon Shakespeare Festival!" This internationally renowned theater has become an economic engine for the town, along with organizations such as the Oregon Cabaret Theatre and Ashland Independent Film Festival.

But, though the arts are a large part of this town, they're by no means the city's only attribute. Ashland owes its comfortable, old-timey vibe to community insistence that its 19th-century buildings be preserved. The city now has 48 structures and two historic districts on the National Register of Historic Places. Southern Oregon University is the town's largest employer, and businesses related to outdoor recreation, health services and tourism contribute significantly to the economy.

The city supports several energy-conservation programs, including net metering and financial incentives for residents who install solar systems. The region has experienced serious drought in recent years, but farming and gardening continue to thrive. Ashland's newly launched Lawn Replacement Program encourages people to replant their lawns with less thirsty features.

"We have an amazing assortment of organic family farms here in the Rogue Valley that provide the region with a fantastic variety of food," says Claire Anderson, managing editor of *Home Power* magazine, headquartered in Ashland. In May, voters in Jackson County (which includes Ashland) approved a ballot initiative to ban the cultivation of genetically modified crops within the county's borders. "That was a huge victory for organic farmers here and for others who want to protect our food supply," Anderson says.

Big, Technicolor Skies

Bozeman, Montana. It's one of those cities people visit for the skiing or hiking, or just for the spectacular mountain views, and then never want to leave. The region's rugged Western vibe makes the past almost palpable, and one can easily imagine the Shoshone, Arapaho, Lakota and other native peoples who once ranged and rendezvoused in the region. Equally easy to imagine are the prospectors and settlers who flooded the Montana Territory gold fields and the cattle drives that delivered huge herds to Gallatin Valley.

Bozeman sits on a high plain surrounded by six mountain ranges. It is about 90 miles from Yellowstone National Park and home to Montana State University (MSU), the community's largest employer. Numerous high-tech and biotech companies now call Bozeman home, as do the Gibson Guitar Corporation, Planet Natural gardening supplies and Simms Fishing Products. Radiant Engineering began there as a solar-energy company in the 1970s, and it now sells its patented energy-saving inventions worldwide.

"As a new student at MSU in 1970, I was stunned by the technicolor sunsets that fill the sky and light up the Bridger Mountains with alpenglow," says resident Alice Flynn. "This town has carefully maintained its historic homes, and people all over town avidly grow flowers and gardens that show their pride. It is walkable and lively, and, winter or sum-

Bozeman, Montana

Population: 38,860
Climate: 32" annual avg. precip.; January avg. high: 35° F; July avg. high: 73° F
Median household income: $44,818
Median home price: $259,000

BOZEMAN DAILY CHRONICLE/SEAN SPERRY; BOTTOM: MONTANA STATE UNIVERSITY/KELLY GORHAM

Bozeman, Mont., enjoys a front-row seat to Big Sky Country. Western traditions live on at the Bozeman Stampede (above).

mer, people gather in the heart of downtown."

With one of the lowest unemployment rates in the country (about 3 percent) and predictions of job growth, Bozeman's economy is humming along. Housing is at a premium and creative boomtown lodging solutions are a part of the Bozeman story.

"People rent garages, sofas, spare rooms—wherever they can lay their heads," says Blake Maxwell, editor of *The Bozeman Magpie*, an alternative online news source he founded in 2010. "Finding housing is just part of navigating the challenges of living here." For those who successfully navigate those challenges, though, life is rich.

"Most people in Bozeman are interested in being outdoors as much as possible," says E.J. Porth, communications and outreach manager at Gallatin Valley Land Trust, which works with private landowners to provide stewardship of their farms and ranches. "Everyone here seems to own a dog that they take camping, biking, hiking, fishing—all big pastimes here."

The Community Food Co-op, a cooperatively owned grocery store, specializes in organic foods and Montana-produced meats and vegetables. Wild game, such as antelope, deer, elk and moose, and beef from grass-fed cattle make for an abundance of healthy meat choices. The zero-waste Amaltheia Organic Dairy on the city's outskirts produces up to 2,000 pounds of its goat cheese each week, and the cheese is now distributed throughout the United States.

Weekly concerts on Main Street and performances by the symphony, opera, and theater and ballet companies provide creative nourishment for those who can tear themselves away from the outdoors. The world-renowned Museum of the Rockies houses some of the most famous dinosaur specimens in the world, including tyrannosaurus and triceratops fossils, and the American Computer and Robotics Museum celebrates "brains and thinking machines."

Burlington, Vt., is located on the shore of Lake Champlain. The Intervale Center helps set a national standard for local food systems (right).

Burlington, Vermont

Population: 42,284
Climate: 37" annual avg. precip.; January avg. high: 30° F; July avg. high: 79° F
Median household income: $43,135
Median home price: $259,500

Green Is Just How It's Done

Burlington, Vermont. If one community could serve as poster child for the core values we write about in Mother Earth News, Burlington would be it. Organic gardening, self-sufficiency, an involved community, renewable energy and a commitment to health are how Burlington rolls. Its vibrant local food system is central to the city, and at the heart of that food system is the Intervale Center.

"Intervale" is a term for the low ground between hills, often bottomland enriched by overflow from creeks and rivers. In the 1980s, an intervale tract of more than 700 acres within the city limits had become a dangerous, inhospitable place. Historically productive fields sat abandoned and people were using the land primarily as a dumping ground.

Will Raap, founder of Gardener's Supply Company, led an effort to restore the area and return it to its agricultural roots. Community members hauled off garbage, rebuilt depleted soils and gradually transformed the land to its present condition as a healthy agricultural and recreational resource for Burlington. The Intervale Center now stewards 350 acres of this land, and Raap's vision of an agricultural oasis that could feed Burlington's citizens has become a reality.

"Burlington is uniquely lucky to have a vast green expanse of farmland within the city limits," says Travis Marcotte, executive director of the Intervale Center. "For 25 years, we've been building a community food system, modeling how to incubate new farms and develop farm-related businesses, how to market agricultural products and care for the land, and how to develop farm-to-school and farm-to-table programs."

Marcotte says the Vermont Agency of Agriculture has steadfastly supported the development of this strong food system, carrying out its mission to protect the "working landscape" as the back-

CITY MARKET/ONION RIVER CO-OP; TOP: ISTOCKPHOTO/ERIKA MITCHELL

bone of Vermont's economy. For more on statewide initiatives in Vermont addressing environmental health and community resilience, read "Go, Vermont!" on Page 16.

The Intervale Center was largely responsible for creating the lively local food scene in Burlington, and now the entire city is experiencing an explosion of innovation by chefs and brewers. Food Truck Fest offers a re-imagined "truck stop" where residents can gather for craft brews or locally roasted coffees on Friday nights while local musicians perform and artists show their work. In winter, the festivities move indoors to ArtsRiot, an arts-and-culture incubator that features different chefs throughout the week, as well as cooking demonstrations, live music, dance parties and art exhibits.

Burlington is home to the University of Vermont, and the region offers a wide variety of outdoor activities thanks to beaches along the banks of Lake Champlain within the city limits, as well as trails for biking, hiking, cross-country skiing, and snowboarding.

The Vermont Energy Investment Corporation, an international consulting firm that focuses on reducing the environmental and economic impact of energy use, is one of Burlington's largest employers. A local business, CarShare Vermont, provides a network of Toyota Prii and Honda Fits parked conveniently throughout Burlington. For a small fee, members can use a car for an hour, or take one out for a day trip into the mountains.

A relatively new community resource is Front Porch Forum (FPF), a Web-based communication tool that people join by neighborhood to post about everything from lost cats to local politics. More than two-thirds of Burlington neighborhoods connect via FPF, and the network is expanding throughout Vermont.

Evanston, Illinois

Population: 75,570
Climate: 38" annual avg. precip.; January avg. high: 34° F; July avg. high: 81° F
Median household income: $68,051
Median home price: $367,800

Evanston, Ill., sits 12 miles north of Chicago (in background), along the shore of Lake Michigan. Residents frequently gather at Northwestern University for events that share the university community's expertise (top).

Working for the World They Want

Evanston, Illinois. If you've ever felt that nothing you do can make a difference for the challenges we face these days, consider this: In 2006, dozens of Evanston residents partnered with city staff to draft the city's Climate Action Plan, with strategies to fulfill the city's pledge in signing the U.S. Mayors Climate Protection Agreement.

Evanston achieved its goal of a 13 percent reduction in emissions (from its 2005 baseline) in the summer of 2013, and in May, Evanston's Sustainable Programs Coordinator and the group Sustain Evanston presented a new goal: a 20 percent reduction by 2016.

Home to Northwestern University, this suburban city 12 miles north of Chicago has taken on climate change in a real way. Its Office of Sustainability supports initiatives for renewable energy, energy efficiency, transportation, waste reduction and recycling, water conservation, and land use. The city recently installed protected bike lanes on two major streets and has plans to install more. More than 2,000 people gathered for the 2013 Streets Alive! event to show support for public transportation and a more pedestrian-friendly city.

According to Eleanor Revelle, president of Citizens' Greener Evanston, citizen involvement helps make Evanston a remarkable place to live. As a gauge of this involvement, one of the ways the city celebrated its 150th year in 2013 was by logging 150,000 volunteer hours.

Residents have proved that they don't mind getting a little dirt under their fingernails in the name of community involvement. More than 50 volunteers help twice a year at Perkins Woods, a 7½-acre forest

LAWRENCE OKRENT; TOP: NORTHWESTERN UNIVERSITY/STEPHEN ANZALDI

Lincoln, Nebraska

Population: 268,738
Climate: 29" annual avg. precip.; January avg. high: 37° F; July avg. high: 85° F
Median household income: $49,504
Median home price: $142,200

The Lincoln Municipal Band has played in Lincoln, Neb., for 100 years. Families work in the CROPS Antelope Community Garden (top left). All aboard for the Lincoln Children's Zoo (top right).

remnant in northwest Evanston, to eliminate invasive plants. Forest steward Libby Hill says the volunteers undertake this sweaty, dirty labor because they just love the woods.

"The individuals who first set aside this preserve felt people needed somewhere to go to get away and have some breathing room," Hill says. "We are lucky as a city that we had influential leaders who had the mindset not just to make as much money as they could, but also to care about the community. We want to do something now that will matter in the same way to the future."

Clean and Green in Lincoln

Lincoln, Nebraska. Despite more than a quarter-million residents, Lincoln manages to maintain its hometown feel. Its extensive bike paths and multiple community gardens bring neighbors together. At last count, 45 neighborhood associations were registered within the city limits.

As home to the University of Nebraska-Lincoln and Nebraska's state government, Lincoln has all the attributes and activities of both a college town and a metropolitan center, with fewer big-city problems, according to Tim Rinne, a 40-year Lincoln resident and state coordinator for Nebraskans for Peace. Rinne says Lincoln embodies the state's new tourism campaign—"Visit Nebraska. Visit Nice."—not in a bland or boring way, but as a place where life is good and residents give thoughtful attention to its quality.

"There's an operating assumption here that people will behave civilly in public," Rinne says. "The 'nice' part would be hokey if it weren't true. The multicultural, mixed-income nature of our historic neighborhoods gives our 'nice' Nebraska lifestyles a sense of authenticity. It's why I've lived here nearly 40 years and never mean to leave." (For more on Rinne's neighborhood's approach to sustainability, see "Homestead Hamlets," *http://goo.gl/XTMEXg*.)

Lincoln boasts a diversified, stable economy, with an unemployment rate below 3 percent. In addition to the state government and the university, prominent industries in the city include banking, information technology, call centers and insurance. A tech boom is underway and the Lincoln-Omaha area is sometimes referred to as the Silicon Prairie. Compared with larger cities, wages are low, but Lincoln consistently tops lists of the nation's healthiest and happiest cities, showing that positive lifestyle factors, such as a manageable cost of living and reduced stress levels, offset the lower pay scale. To make things even better, the city launched a "Cleaner, Greener Lincoln" initiative to put Lincoln at the forefront of environmentally sustainable cities.

Lincoln has an excellent trail system for walking and biking, and the city is installing bicycle lanes in the downtown area. Numerous parks dot the city, providing ample opportunity for outdoor recreation and connection with nature.

In recent years, gardening has taken hold, and Community CROPS (Combining Resources, Opportunities and People for Sustainability) is increasing the ranks of gardeners. The group started in 2003 with one community garden and now includes 13 sites, a training farm, a community-supported agriculture (CSA) program, a farmstand, six staff members and a corps of volunteers.

Djuka Selendic, site coordinator for the CROPS Antelope Community Garden, says the organization has expanded her gar-

CLOCKWISE FROM TOP LEFT: PRAIRIE FIRE NEWSPAPER/JOHN DORAN; LINCOLN CHILDREN'S ZOO; LINCOLN MUNICIPAL BAND

den know-how, and has earned the "community" part of its name. "I've lived in Lincoln since 1996, when I emigrated from my home country of Croatia," Selendic says. "Involvement in CROPS has provided me with so many new friends—and many new recipes."

The city has been proactive in approving front-yard food gardens, and has even given a green light to those who want to garden in the public right of way between the sidewalk and curb. In most places, this hard-to-manage, narrow tract is called the "hell-strip." The nice people of Lincoln might call it the "heckstrip."

A Chain of Tradition

Penns Valley, Pennsylvania. This community in central Pennsylvania is not a single city, but a string of tiny towns that dot the valley along the main roadway. Its beautiful ridge-and-valley topography challenged settlers who arrived in the early 1800s, but many of those families remained in the area, forming the communities of Millheim, Centre Hall and Spring Mills.

"The older generations in this area set a tone with their mores and traditions," says Cyndy Engle, who has lived in the area for 12 years and was attracted to it because of its undercurrent of respect and care, and because of her appreciation of the area's history. It is, however, a place where a "quick trip" to the grocery store can end up taking an hour, she says. "You see people you know in every aisle and you stop to catch up on their family news. The deli counter person knows what your family likes and also makes recommendations for events going on in the valley. At checkout, the cashier not only knows your name, but also how you like to have your produce packed.

"The grocery shelves are lined with products bearing local family names," Engle says. "I love knowing that the food I eat was grown in the same soil as that on the bottom of my shoes."

Penns Valley, Pennsylvania

Population: 2,424
Climate: 42" annual avg. precip.; January avg. high: 35° F; July avg. high: 81° F
Median household income: $47,419
Median home price: $147,781

Brian Snyder of the nationally recognized Pennsylvania Association for Sustainable Agriculture says PASA works statewide to bring farmers together to learn from each other and to build relationships with consumers looking for fresh, local and sustainably produced food. "Our soils are rich here, and home gardens proliferate—many in the front yard," Snyder says. "Many gardeners raise their own meat animals alongside their vegetable gardens."

Though within the State College, Pa., metropolitan statistical area, drivers through Penns Valley frequently share the road with horse-drawn buggies of local Amish residents. The valley abounds with quality dairies, and Pennsylvania leads the country in availability of raw milk, says PASA's Lauren Smith. The organization has worked to keep raw milk legal, and the Pennsylvania Department of Agriculture has supported that initiative. Nearly 200 farms throughout the state are now licensed to sell raw milk.

The quickest way for newcomers to become a part of the community, Engle says, is to volunteer and demonstrate that they're willing to work for the betterment of life there. Protecting the land and water have been citizen priorities, she says, because everyone knows that the great local foods they enjoy depend on good water and land that's safe from pollutants.

Life at a Manageable Pace

Sparta, Tennessee. Margaret Petre's family has lived in the hills and hollers of White County, Tenn., since the early 1800s, and she's been visiting there all her life. A year ago, she and her husband decided to sell everything and move home to Sparta, located

CYNDY ENGLEY (3)

Several hamlets make up Penns Valley, Pa., where you can spot Amish buggies traversing the valley (right) and the Neff Round Barn in Centre Hall (top).

Sparta, Tennessee

Population: 5,047
Climate: 54" annual avg. precip.; January avg. high: 52° F; July avg. high: 88° F
Median household income: $26,475
Median home price: $93,400

Surrounded by spectacular natural beauty that includes Burgess Falls (bottom), Sparta, Tenn., also features a lively downtown, with weekly bluegrass music and monthly classic car cruises (top).

equidistant between Nashville and Knoxville in the upper Cumberland Mountains.

"Sparta has a one-room post office and a market that will carry your balance 'on a card' for you—that's an index card, not a credit card," Petre says. "My husband and I now have a log cabin in the woods, with the mountains as a backdrop, and I think you could say we're living the dream."

Though gardeners in the area have to contend with red clay soil, most everyone in town grows something and, as Petre says, "It's so embedded here, people don't even think of themselves as gardeners—raising food is just what you do. We're so rural, there aren't many ordinances. You'd be surprised what you might see in front yards around here."

If you've heard *The Beverly Hillbillies* theme song, you've heard Sparta's native son, Lester Flatt, playing banjo. Lester Flatt Memorial Bluegrass Day is part of Sparta's annual Liberty Square Celebration, and bluegrass bands play on the square every Saturday evening. White County boasts more waterfalls and caves than any county in the state, says Jody Sliger of the Sparta and White County Chamber of Commerce. Recreation, from hiking and biking to kayaking and canoeing, draws thousands of visitors to the region each year and supports a major part of Sparta's economy.

Dave and Don Sergio, brothers who have lived in Sparta since they were young children, started Calfkiller Brewing Company in 2008, named for the Calfkiller River, which runs through White County. Their microbrewery now furnishes local beer to several area restaurants. Dave says he loves living in Sparta because "There are no tall buildings, but lots of tall trees; no traffic jams, but chickens in people's yards."

"Nature is everywhere here," Petre says. "Just today I've seen deer, turkey, snakes, squirrels, ducks, geese and a fox. There's no public transportation—no buses, cabs or trains. But these wouldn't be expected in a town with a population of 5,000. That's part of the joy of a small town. I had to yield to a horse and buggy this week."

The cost of living in Sparta is about 25 percent less than the national average. The downside to living in such a small, inexpensive town is that unemployment is high and job opportunities are low. However, the low tax rate and reasonable housing prices make it an appealing community for those wanting to simplify their lives.

Potter and gallery owner Thor McNeil sees the area's growing arts community as a harbinger of future economic growth.

"Our history has been in industry, so that's where a lot of people still look when they think of 'development,'" McNeil says. "Because of the low cost of living, the area is home to several artists and they contribute to a vital part of the economy that's growing all the time. And as far as creating a local food system—not just growing the food, but processing it and adding value to it—we've just gotten started with that adventure."

K.C. Compton is an editor for Mother Earth News. She has visited 44 states, and has seen great places and met great people all along the way.

WHERE TO NEXT? For a tour of several more community-focused towns and cities, visit the entire collection of our "Great Places You've (Maybe) Never Heard Of" annual series at *www.MotherEarthNews.com/Great-Places.*

KEN GABLES; TOP: SPARTA-WHITE COUNTY CHAMBER OF COMMERCE/JODY SLIGER

Homesteader's Guide to SMALL TRACTORS

Our tractor expert explains the basics and lays out what to look for.

By Oscar H. Will III

When looking at tractors, most folks can tell the difference between an orange Kubota, a green John Deere and a blue New Holland. Choosing the right small tractor for your homesteading needs, however, requires closer scrutiny. Today's diminutive machines are available in a wide price range—which is related to an even wider range in capacity and capability. Work a light-duty lawn tractor too hard and you might wind up with a $2,000 boat anchor. Only use your subcompact tractor to keep an acre of lawn trimmed and you've got a $15,000 riding mower in your barn.

North America's smallest tractors were born as "garden tractors" shortly after World War I, when folks began trading animal power for petroleum power to keep their backyard vegetable gardens or market gardens producing. These early contraptions were heavy and cumbersome; most were con-

Attachment options available for Yanmar's 424 subcompact tractor make it a versatile machine for homesteaders.

structed with a single pair of drive wheels. Two-wheel tractors are still available today (see "Two Wheels May Be All You Need" on Page 47), and they're capable of carrying out substantial work while the operator gets a nice workout at the same time. The first garden-sized tractors with four wheels were produced shortly before the Great Depression, and the genre exploded after World War II.

Virtually all early garden tractors were built to withstand long days of hard pulling with ground-engaging implements, such as plows, in tow. Those machines had sufficient weight and traction, and stout-enough transmissions for extended pulling. Before 1960, most garden tractors got the work done with less than 6 horsepower at the drawbar. Today, not all small tractors are designed with pulling in mind — even those with more than 25 horsepower — but they all have a purpose, and we aim to help you make the right choice. But first, if you're bewildered by horsepower ratings, check out "Horsepower vs. Traction," below, before reading on.

John Deere's X534 garden tractor offers two-pedal foot control for quick and easy changes in direction and speed.

Lawn Tractors

At the lighter-duty end of the small-tractor spectrum are machines that look just like their bigger brothers, complete with large rear tires and a simple drawbar hitch. Called "lawn tractors," these machines are lighter (about 500 pounds) than those in the similarly sized garden-tractor class, and, in many cases, they have engines rated with more than 25 horsepower.

Most new lawn tractors are equipped with hydrostatic transaxles encased in lightweight aluminum alloy or pot-metal housings. These transaxles are generally connected to the tractor's engine with a drive belt and are perfect if you use the lawn tractor as intended — for mowing grass and light towing or pushing. They're easy to break if you try to mount too much weight on the lawn tractor or engage in hard pulling with enhanced traction (such as with bar-lug tires, tire chains or rear-wheel weights).

If you need a serviceable and handy riding mower (for up to about 2½ acres) that can pull a garden cart, leaf sweeper, grass clipping bagger, fertilizer spreader or a dethatcher, or occasionally push a little snow with a front-mounted blade, then a lawn tractor is right for you. They usually cost between $1,000 and $3,000.

Remember, however, that just because the lawn tractor has a drawbar hitch doesn't mean you should use it to pull a self-powered rotary tiller through an acre of garden, or

Horsepower vs. Traction

When shopping around for a tractor, you will be inundated with all manner of specification numbers. The numbers most prominently advertised by manufacturers relate to horsepower measurements taken at the engine, power take-off (PTO) or drawbar.

When you are looking at a lawn tractor, higher engine horsepower numbers should relate to the size of cutting deck the tractor can efficiently run — the wider the deck, the more horsepower required. However, there is a tendency among manufacturers to seek bragging rights by producing the most powerful lawn tractor out there. For consumers, this horsepower competition means most lawn tractors are much more than adequately powered. You can easily drive a 50-inch-wide cutting deck with a 15-horsepower engine, which means that 25 horsepower really isn't necessary. Furthermore, the transaxles on lawn tractors would quickly self-destruct if they were asked to deliver anywhere near the full 25 engine-horsepower to the ground in a tough pulling situation.

Thankfully, lawn tractors are so light that, in most cases, when the transaxle is overpowered, the rear wheels will start to spin long before the axle shafts twist in two.

Subcompact tractors are designed to convert more of the engine horsepower into ground-engaging pulling power ("drawbar horsepower"). These machines are built to have maximum traction while keeping sufficient reserve power to run implements ("PTO horsepower").

So, if you truly have a need for a 54-inch-wide cutting deck on a lawn tractor, then the 25-horsepower model might make sense. However, you will be able to safely and effectively pull much more weight with an 18-horsepower diesel subcompact tractor, which would have no problem driving a 54-inch mowing deck at a slightly lower ground speed than the lawn tractor. Garden tractors fall between lawn tractors and subcompact tractors in terms of traction, but overlap completely in terms of engine horsepower rating.

JOHN DEERE; PAGE 44: YANMAR

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Kubota offers a wide range of implements for its BX25D-1, which turns the subcompact tractor into a great all-around machine for working in the garden, barn or pasture.

tow a stoneboat across a freshly tilled field. The powertrains on these machines are definitely not designed for frequent heavy towing.

Garden Tractors

Not always easy to distinguish from lawn tractors at first glance, modern garden tractors have underpinnings with heavy-duty hydrostatic transaxles (often with cast-iron housings, many connected to the engine with a driveshaft), and rear hitches designed to pull.

Check the specs on a true garden tractor, and it'll likely weigh more than 700 pounds. Garden tractors may also come with front or rear hitches attached to hydraulic or electric lifts, and hydraulic systems designed to run auxiliary equipment or attachments, such as mounted snow throwers, angle plows, rotary tillers, disc harrows and even small front-end loaders.

Garden tractors can be equipped with heavy-duty, belly-mounted finish mowers and are particularly well-suited to cutting more acres of lawn than even the most robust lawn tractors. In short, the garden tractor is able to do the same things a lawn tractor can do, plus pull or push ground-engaging tools with ease.

Because of their sturdy powertrains, most garden tractors can be safely ballasted with fluid in the tires, front or rear chassis weights, wheel weights, or drawbar-mounted weight boxes to enhance stability and traction. You can also safely mount bar-lug agricultural-style tires on a garden tractor's drive wheels for even more traction, without worrying about breaking the axle shafts.

If you have 3 or more acres of lawn to mow and maintain, grow a big food garden, muck out one or two animal stalls, or routinely need to grade your gravel lane and remove snow from it in winter, then a garden tractor is just what you need. You can expect to spend at least $6,000 for a nicely equipped model. Just don't make the mistake of trying to use your new tractor as a heavy-duty landscaping or construction machine. The garden tractor's frame simply isn't up to the abuses that commercial-grade work will impose—for that you'll need the more robust four-wheel-drive subcompact tractor for extended capability and increased life span.

Subcompact Tractors

The first readily available subcompact tractors to make it to North America were born in Japan—lightweight and diminutive diesel tractors bearing names such as Kubota, Satoh Beaver and Bolens G174 (the latter two built by Mitsubishi) were

A tiller implement is one of many available attachments for BCS walk-behind tractors.

Two Wheels May Be All You Need

The two-wheel garden tractor has a long history throughout much of the agricultural world. These tractors are constructed with cast-iron clutch, transmission and axle housings, much like the engine-to-axle components on a subcompact tractor, only on a much smaller scale. The two-wheel walking tractor is controlled from behind, or the side, or the front (while running in reverse) with an adjustable handlebar, and it can be equipped with grader blades, land plows, rotary tillers, snowblowers, rough country mowers, miniature hay mowers, miniature hay rakes, miniature hay balers and even dump-cart bodies.

Modern two-wheel tractors are quite popular in vineyards, berry patches and other small agricultural enterprises, especially those with considerable slope. Although they are not inexpensive (expect to pay at least $2,000 for a good two-wheel tractor with tiller), two-wheel tractors make a lot of sense for folks who already own a mower for the lawn and need to intensively work relatively few garden or field acres. Learn more about using walk-behind tractors for small-scale farming at *http://goo.gl/mTVYiH*.

Mahindra's MAX 25 subcompact tractor makes an excellent platform for digging attachments.

among the first on the scene. Also landing on our shores were variously branded Isuzu- and Kimco-built machines. These tractors were classified as garden tractors at the time, because the compact and subcompact designations really hadn't been defined yet. But these small tractors were built just like larger farm tractors with heavy cast-iron housings for the transaxle, transmission(s), clutch housing and engine block that, when bolted together, created a virtually indestructible chassis.

Today, the subcompact tractor genre is situated between the garden tractor and the compact tractor. Virtually all subcompact tractors weigh more than 1,200 pounds without implements attached, and they're stout enough to pull or push some multiple of their weight. They're also capable of lifting roughly 50 percent of their weight and carrying more than their weight.

Subcompact tractors make great platforms for attaching small loaders and backhoes; they're usually equipped with the industry-standard rear three-point hitch, and front, mid and rear power take-off points, which make them about as versatile as any larger tractor — but more effective for smaller jobs. Most subcompact tractors sold in the United States are equipped with four-wheel drive, and all of these machines are diesel-powered.

If you have more than 5 rough country acres to mow or need a heavy-duty tractor to till an acre or more, push gravel, grade the landscape, clean large barns, handle tons of topsoil and mulch, haul tons of rock and firewood, or move a lot of snow — and you plan to do all of that for a decade or two — then the subcompact tractor is your best bet. The subcompact tractor will do it all and then some, but it won't be the most efficient fractional-acreage lawn mower any more than it would be the tool of choice for putting up 40 acres of hay. But for folks with plenty of land and a budget for a single tractor, the subcompact makes sense — expect to pay at least $12,000 for a basic subcompact unit, before you add a mowing deck or loader.

Former owner of a 20-something-unit tractor collection, *Grit* Editor-in-Chief Hank Will currently employs two lawn tractors, three garden tractors and one compact tractor to get the work done around his place, where he raises hair sheep, heritage cattle and many varieties of open-pollinated corn.

SOURCES

LAWN & GARDEN TRACTORS

Cub Cadet
www.CubCadet.com

John Deere
www.Deere.com

MTD
www.MTDProducts.com

Toro
www.Toro.com

Husqvarna
www.Husqvarna.com

Simplicity
www.SimplicityMfg.com

Snapper
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Branson
www.BransonTractor.com

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www.TYM-Tractors.com

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www.LSTractorUSA.com

TWO-WHEEL TRACTORS

Earth Tools
www.EarthToolsBCS.com

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MAHINDRA; PAGE 47, TOP: KUBOTA; BOTTOM: SCOTT HOLLIS

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GREG GARBOS

Build This Portable, MULTIPURPOSE GREENHOUSE

This versatile, DIY "Modular Grow Dome" can house seedlings and chicks in winter, pasture poultry in summer, and extend your harvests in fall.

By Greg Garbos and Mike Bollinger

Imagine having a single portable hoop house that you could use in winter to grow crops and start seedlings, and then employ again in summer to safely keep chickens on pasture. Using just one piece of equipment to accomplish these tasks and more is the goal of our new Modular Grow Dome design, a collaboration between Mother Earth News and our company, Four Season Tools.

Inspired in part by the ever-innovative work of Maine market gardener Eliot Coleman, we've outlined several options for building a sturdy, movable hoop house for year-round gardening. From these options, you can choose the best fit based on whether you need a small unit for your backyard or want to connect a series of domes to extend the season for larger-scale vegetable production. You can round up all the parts for these designs yourself, or let us gather everything you'll need by purchasing a kit, which can be shipped via UPS or FedEx (see "Resources," Page 53).

The hoop houses are engineered in 12-foot and 15-foot widths and are fitted with bracing, "ski tips" and anchoring, so they're easy to move manually and simple to secure after being positioned.

Most greenhouses on the market aren't mobile. Plastic-film hoop houses, also called "high tunnels," are used pri-

The "ski tips" (above) help the greenhouse slide across the ground without snagging. Or, two to four people can lift and relocate the unit (right).

marily by market farmers and are large and stationary. Smaller glass or rigid-plastic greenhouses are often expensive and aren't designed to be moved. Our Grow Domes are easily portable, however, and their movability is key to the units being suitable for multiple functions, including large-scale vegetable production. Mobile domes help mitigate problems with pest and disease buildup common in stationary greenhouses. They can rotate with your crops or provide a predator-resistant place to pasture poultry. The kits also allow for flexibility in size, so a unit can meet specific zoning size limits or be considered "temporary" on urban or residential lots subject to building restrictions. The domes on our City Bitty Farm in Kansas City, Mo., for example, are less than 200 square feet, which is below the city's requirement for a building permit.

Our dome frames are made from off-the-shelf steel pipe and fittings commonly used for chain-link fences. In addition to the framing, the kits include 6-millimeter, UV-resistant greenhouse film as well as special hardware and channels with spring wire that make it easy to install and replace both plastic and shade cloth as needed.

A Truly Multipurpose, Portable Structure

Greenhouses are good for growing plants mostly in fall, winter and early spring. Pens for raising pastured broilers are necessary for only a few weeks in summer or fall. The Modular Grow Dome anticipates both uses. The plastic covering transmits plenty of light for plant growth, and if you use the unit to keep hens for eggs in winter, solar heat gain will keep the birds warm on sunny days. In spring, you could start seeds at the same time you brood some chicks. In summer, you can either move the unit into a shady area for poultry or replace the plastic with a shade cloth, all while experimenting with heat-loving summer crops.

If you plan to use your dome for chickens, you should make it predator-resistant. Double-walled corrugated plastic — instead of greenhouse plastic — will keep predators out, but it's quite pricey. Lining the inside of the dome with wire fencing or hardware

A small flock can fare finely in this clever "Chicksaw" offered by Four Season Tools.

The Pastured-Poultry 'Chicksaw'

Four Season Tools' new "Chicksaw" unit debuted at the Mother Earth News Fair in Lawrence, Kan., last fall. This rickshaw-like, two-wheel coop provides portable housing for a small flock of broilers or laying hens. In addition, the coop slides off its cart easily, making it a snap to move a series of coops to fresh grazing locations, plus giving you the convenience of a spacious 6-by-6-foot or 6-by-8-foot garden cart for moving seedling flats and performing other tasks.

Both the Modular Grow Dome and the Chicksaw will be at the Four Season Tools booth at the Mother Earth News Fair on Oct. 25 and 26 in Topeka, Kan. For more information on all of our Fairs, head to *www.MotherEarthNewsFair.com*.

— *Mother*

GREG GARBOS (2); TOP RIGHT: DEBORAH WELKY MILES

Modular Grow Dome co-creator Greg Garbos and his son, Orion, stand between two low tunnels inside a 15-foot-wide dome. This double layer of protection can "move your garden south."

cloth (both readily available at hardware or farm stores) is a more affordable alternative. Depending on how much predator pressure you have, you could also install some wire flaps around the perimeter to deter digging.

New Options for Market Gardeners

As a single-unit hoop house, the 12-foot-wide dome provides space for three 30-inch beds separated by 1½-foot-wide walkways. We also offer a 15-foot width for four 30-inch beds separated by 1½-foot-wide walkways. If you want more growing space, you can hook two or more units together using our 4-foot-long connector piece. You can use your units separately during the warmest months when protected growing space may not be necessary, and then combine them as temperatures drop to create a spacious winter growing area. Long structures known as "caterpillar tunnels" are common for larger-scale vegetable production, but connecting multiple movable domes is a more flexible option that will allow you to reconfigure and relocate as needed, at a dramatically lower price per square foot.

With such a cozy interior, you'll be able to bring chickens to your farm earlier in spring. The unit provides refuge from the elements and can easily be moved from place to place by two to four adults or a small tractor. Such a setup lets you give birds new grazing ground at a moment's notice. With this extra space and protection, market farmers could raise chickens year-round to sell eggs and meat.

Our 15-foot-wide unit can provide even more protection from cold if combined with the low tunnels popularized by Eliot Coleman. Low tunnels are commonly constructed from 10-foot pieces of half-inch electrical conduit bent into half-circles, giving growers 6-foot-diameter tunnels that are 3 feet high. One low tunnel will cover two 30-inch-wide beds. So, in the slightly larger 15-foot-wide version, you'll gain increased growing space plus the ability to install two low tunnels side by side, covered by fabric row cover (see photo at left). Coleman has discovered that placing these low tunnels inside a greenhouse furnishes your crops with temperatures that mimic those of nearly one full hardiness zone south of your location.

Grow Dome Setup

Adequate ventilation is essential to avoid overheating within the domes. The end-wall design is a critical part of the ventilation strategy. Our design includes two end-wall choices: low-cost "scissor doors" that allow both ends of the hoop house to open as needed, or square, steel, prefabricated end walls sized for screen doors. You can cinch up the plastic on the sides of longer buildings on hot days to allow for airflow.

For all movable buildings, stability in wind and snow is an important consideration. A Modular Grow Dome unit is held down by two T-posts at each corner. The posts are installed in opposing directions through welded rings bolted to the ski tips on the skids (see photo, Page 52).

You could use your Modular Grow Dome as a shelter for ducks, turkeys or, with some reinforcing, larger animals, such as goats or pigs. Perhaps you need a warm spot to store compost to keep it thawed and ready for early spring use. Or maybe you're imagining a warm, moisture-free place to plant seed flats, cure crops, dry seeds or store hay. These space-saving, simple and versatile units offer endless possibilities for backyard gardeners as well as large-scale market farmers.

RESOURCES

Plans and construction details for the Modular Grow Dome are available online at *www.MotherEarthNews.com/Grow-Dome*. Four Season Tools (*www.SmallFarmTools.com*) has a free online catalog that offers the Modular Grow Dome kit as well as other agriculture products, including low tunnel benders, row covers, and larger movable greenhouses and coops. The Modular Grow Dome kits include pipes, bracing, fittings, plastic and instructions. Several options are available, but basic kits without the T-posts or 6-millimeter plastic come in two sizes: 12 by 12 feet for $765 with stationary ground posts, or $825 on skids; or 15 by 12 feet for $875 with ground posts, or $935 on skids. A 15-by-140-foot building (nine domes with eight connectors) costs $4,875 with ground posts, or $5,395 on skids.

Four Season Tools founders Greg Garbos and Mike Bollinger re-imagine scale-appropriate systems for year-round food production with innovations in movable greenhouses and season extension. Greg lives with his family on City Bitty Farm in Kansas City, Mo., and Mike and his family live on River Root Farm in Decorah, Iowa.

DEBORAH WELKY MILES

Circle #48; see card pg 81

ICELANDIC CHICKENS

An Ancient Breed for Modern Homesteads

These colorful, self-reliant birds will deliver flavorful meat and a steady supply of eggs.

By Harvey Ussery

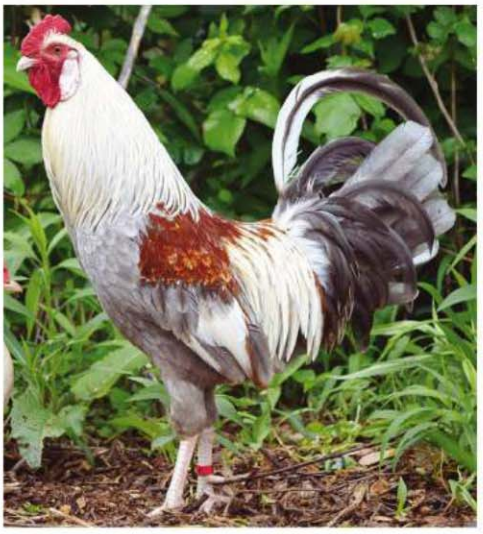
In addition to being *fun*, keeping a home flock of chickens makes us less dependent on purchased food. But how much does our flock contribute to food independence if it is itself dependent on purchased feed — and on purchases of replacement chicks? Manufactured feeds and mail-order chicks scarcely fit earlier models for sustainable home flocks, which were historically managed as *scavengers* of free natural feeds, and in which replacement birds were the spontaneous gift of "broodiness," or a mother hen's instinct to hatch eggs — a trait that has been deliberately bred out of modern breeds.

I'm fortunate to have had a living example of a traditional model: My grandmother's rugged flock fed themselves almost entirely by ranging over her 50-acre farm. From time to time a hen would disappear, only to show up three weeks later with a clutch of chicks in tow. Granny kept that self-feeding, self-replicating flock going for decades. Every egg, every piece of fried chicken, and every serving of chicken and dumplings came to her table *without cost*.

I strive to emulate my grandmother's flock management: I give my chickens as much range to forage as possible while getting their help with homestead chores — cover-crop tilling, making compost and controlling insects — as benefits incidental to their quest for live, wild foods. I also prefer hatching chicks under my own mother hens, rather than purchasing them from elsewhere or using an incubator. When I learned the fascinating history of Icelandic chickens, I wondered whether they might be the best choice for my ideal flock.

Norse settlers brought their home flocks to Iceland in the ninth century. For more than a thousand years, the only chickens in the country were of this robust breed.





A visual kaleidoscope: Icelandics boast great personalities and display nearly every plumage pattern imaginable.

The History of 'Icies'

Icelandic chickens (or "Icies") originated with the settlement of Iceland in the ninth century by the Norse, who brought their farmstead chickens with them. In Iceland these birds are known as *Íslenska landnámshænan*, or "Icelandic chicken of the settlers." Over the centuries, farmers selected birds capable of feeding themselves, and hens with reliable mothering skills. The result was a landrace of active, naturally healthy fowl adapted to harsh conditions. (A landrace is a group of domesticated stock adapted to local conditions and selected for useful traits rather than for conformation to specific breed standards, such as color, pattern or comb style.) Icelandics are on the small side (mature cocks weigh 4½ to 5½ pounds; hens, 3 to 3½ pounds) but have good egg production, especially in winter.

For more than a thousand years, the *only* chickens in Iceland were of this robust landrace. But in the 1930s, strains of Leghorns were imported to boost commercial egg and meat production. Inevitably, those chickens were crossed with some of the natives, and the pure landrace was in danger of being lost. Efforts to conserve the native population began in the 1970s. The success of these efforts was followed by importation of these genetically unique birds into other countries, including the United States.

My First Flock

In 2013, two experienced breeders of Icies supplied me with four pullets and three cockerels, representing together all four of the lineages that had been imported into the United States to date. The birds were 4 to 6 months old, but already mating. When hens from my previous flock became broody, I had plenty of Icelandic hatching eggs ready to set under them.

In addition to the broodies from my old flock, two of my four Icelandic pullets went broody and proved to be excellent mothers. The brooding season ended with a total of six dozen chicks. By the onset of winter, I had culled the excess young males and some of the females to end with a breeding flock of 27 birds total: one cockerel (male younger than 1 year), one cock (older male) and seven females in each of three "clans" or "fami-

HARVEY USSERY (7); PAGE 55: LISA RICHARDS

The author's flock forages "debris fields"—areas covered with organic residues common on a homestead.

Icelandics need ample room to range, on ground that's as biologically diverse as possible.

lies." (Read on to learn more about my breeding program.)

The ongoing culling furnished all of our chicken dinners last year. Icelandic chickens' flesh is fine-grained and unusually flavorful, even compared with meat from other home-raised breeds. When we retire our older layers, I'm sure they'll make superb broth as well.

Foragers First

In the year and a half that I've raised Icies, they've met my goals for a more self-sufficient homestead flock much better than the dozens of other breeds I've raised over the years. I have ranged them on pasture, in a small area of woods, and on "mixed organic debris fields" — areas heavily covered with the organic residues produced on any homestead, such as autumn leaves, weeds, spent crop plants, flower bed trimmings, prunings from fruit trees, and even sectioned tree trunks. The result has been a series of compost heaps increasingly alive with decomposer organisms. These debris fields are my Icies' favorite places to forage. In their native land, these birds are also called *Haughænsni*, or "pile chickens," because of their preference for such debris heaps.

Icies are aggressive foragers, seeking out natural foods and visiting the feeder only as a backup. My use of purchased feed has dropped by more than half — eliminating it entirely could well happen as I increase the number and diversity of ranging areas on my property.

Start with stock from a breeder committed to ensuring purity of this breed.

Lavish Layers

Icelandic egg production is good compared with the real egg-laying champs, such as Leghorns, Minorcas and Rhode Island Reds, and it's excellent for such a self-sufficient breed. In winter, however, Icelandic egg production is *outstanding*. This became abundantly clear to me during one of the harshest winters in the 30 years we've lived in northern Virginia. For parts of the frigid winter, my Icelandics produced two eggs per three hens per day, which is often considered a benchmark for good production, even during summer. Laying rates seemed to rise and fall according to the condition of the ground in the birds' winter range: higher when the soil was unfrozen and they could scratch up worms and grubs, and lower when the ground was frozen. When I prepare my debris fields for next winter, I'll make them deep enough to keep the soil from freezing.

Icelandics continue to deliver strong egg production in winter.

Icelandic eggs are white to cream, and on the small side. Eggs from my older hens average 1¾ ounces, equal to commercial eggs graded "medium."

My Icies are hardy, healthy and robust, whether in harsh winter weather or in our hot, humid Mid-Atlantic summer. In the first year I lost only one, a juvenile, to the sort of unexplained death I call JCOS (Just Crapped Out Syndrome). I protect my flock from predators by using electric net fencing, often called "electronet," but they rely on their own skills to avoid attacks from the numerous hawks in our area. To date, I have lost only a single Icie pullet to a hawk.

Broody Breeders

At winter's end, I separated my breeding groups and began saving hatching eggs. Having kept none of my previous flock, I was now entirely dependent on my Icie hens as mothers. Happily, near the end of April, hens began going broody and receiving clutches of eggs every few days. The first clutches hatched after 20 days, and the final clutch hatched just 10 days later for a total of 67 chicks — all we needed for the season, hatched by seven broodies.

Both fertility and hatchability were high: I discarded only four eggs out of 72 at candling (examining the contents of an egg by placing a bright light behind it) for a hatch rate of 94 percent. After setting the last of the seven broodies, I began discouraging broodiness in the remaining hens by collecting eggs frequently enough so that hens were not sitting on eggs when they entered the nest to lay.

As each hatch completed, I gave the new families daytime access to their own well-aged debris field, separate from the main flock. The hens showed the same preference for feeding their babies as they did for feeding themselves, turning up foraged foods for the chicks and occasionally leading them to the feeder. After the chicks were fully feathered, I moved them with their mothers to the main flock, the stage now set for a new round of nurturing, culling and breeding.

Icelandic Chick and Hatching Egg Sources

Icelandic chickens are still relatively rare, and they will be harder to find and more expensive than other breeds. Go to *www.MotherEarthNews.com/Icelandic-Chicken-Sources* to see a list of contact information for suppliers who offer Icelandic chicks and eggs. The list on our website is based on the Icelandic Chickens Facebook group's 2014 Breeders List, which is pinned to the top of its page at *http://goo.gl/x9hZnY*. (If you sell Icelandics, you can add your information to the list, which is editable.) The Icelandic Chickens Facebook group is also a good venue for asking questions and sharing photos of your beloved Icies!

Are Icies Right for You?

If you confine your chickens to a coop or tiny enclosed run, Icelandics aren't the breed for you. They need as much space as you can give them, on ground that's biologically diverse. Confined Icelandics would be miserable, and you would not enjoy them at all.

I recommend starting with Icelandic stock from someone who is *fanatical* about the purity of this breed. Because Icelandics are so diverse in appearance, carelessness in breeding — or even deliberately mixing in "a little of this, a little of that" from other breeds — would not be obvious in the offspring. Genetically pure Icelandics have been honed by their unique history to offer an outstanding suite of utilitarian traits, and that irreplaceable resource must not be frittered away!

You can try your hand at breeding your own ever-improving strain of this ancient landrace. My breeding program uses "clan mating," with breeders maintained in three separate lines. All chicks, whether pullets or cockerels, are assigned to the clan of their mother, but during the breeding season, Clan A cocks breed Clan B hens, Clan B cocks breed Clan C hens, and Clan C cocks breed Clan A hens. Cocks and hens of the same clan do not mate. For more information on improvement breeding and working with broody hens, see my book, *The Small-Scale Poultry Flock*.

Did I mention that keeping chickens is fun? My Icelandics are proving to be the most fun of all: They're active and alert, with great personalities, and among them they display every plumage color and pattern, as well as both single and rose comb styles. Many hens also sport charming crests of feathers on their heads. In a backyard with only one type of chicken, what a bonus that they're such a kaleidoscope!

Harvey Ussery is an innovative modern homesteader. Visit his excellent website at *www.TheModernHomestead.us* and see Page 64 to order his book, *The Small-Scale Poultry Flock*.

PLANT POLLINATION PRIMER

Get the facts on how insects and wind pollinate your crops so you can plant smarter and haul in heftier harvests.

By Barbara Pleasant
Illustrations by Elayne Sears

As humans, it's hard to imagine sex without the ability to move, which is the fundamental challenge of plant pollination. To make seeds, reproductive cells (called "gametes") from separate male and female cells must join, often from separate flowers and sometimes from separate plants—but the plants can't move to help make the miracle happen. Instead, they rely on the resources around them: wind, insects, birds and, sometimes, people.

Understanding plant pollination is more crucial than ever, as we are in the midst of a severe decline of native pollinators because of ubiquitous pesticide use in monocrop agriculture. While we may not be able to change this unsustainable practice overnight, we *can* make some changes in our own backyards to bolster pollinator populations and, in turn, our harvests. Numerous factors that influence successful pollination are within a gardener's control, including planting in certain arrangements, using organic methods, encouraging wild pollinators and, when need be, actively intervening via hand pollination. The benefits of better pollination can be huge with crops that are eaten as mature, seed-bearing fruits, such as berries, corn, cucumbers, tomatoes and tree fruits.

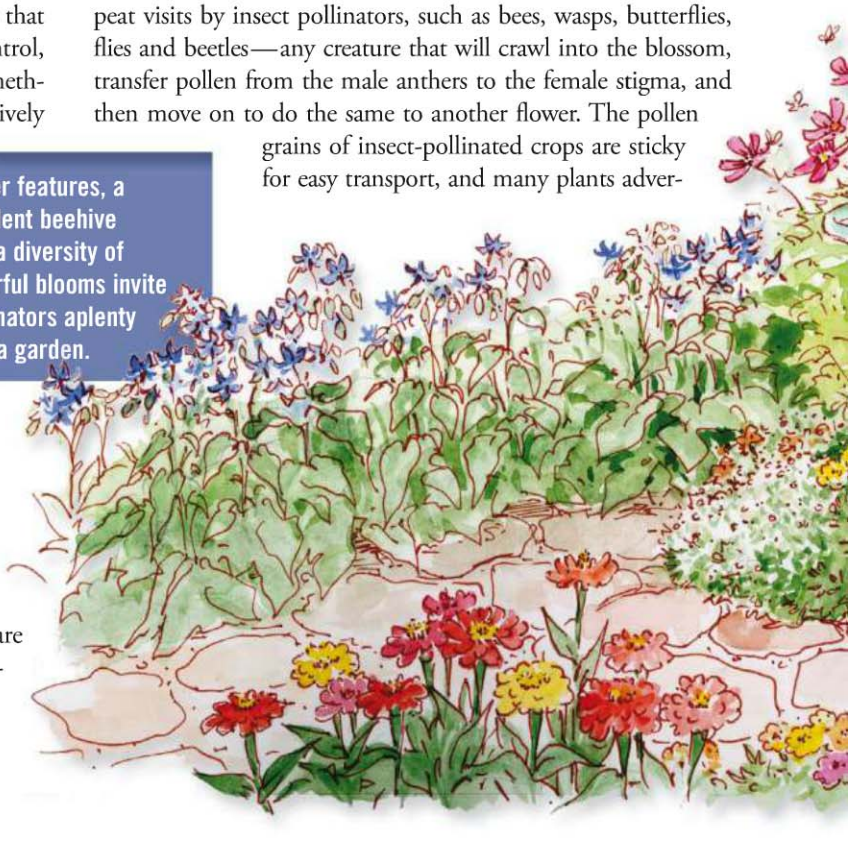
Like most plants, food crops have sophisticated reproductive systems in place, ready to take on the pollination gamble. Delicate female parts are hidden inside the flower, safe from the elements. Plant pollen faces an out-in-the-open, hostile journey—even with a waxy coating and a stash of carbs for energy, male pollen grains must quickly find their way to a receptive female organ. There, they grow a tube that unites them with the ovary, thus forming a fertilized seed.

Self-Fertile Plants

Beans, peas and tomatoes are examples of species that are "self-fertile," which means that all the necessities for successful pollination reside within each flower. A bit of well-timed shaking is all that's needed to sprinkle pollen grains where they need to go, which in nature is done by wind and visits by buzzing insects. When beans, peas and tomatoes bloom but set no fruit, the weather—not a lack of pollinating insects—is usually to blame. Cold or hot weather often causes flower abnormalities that, in turn, cause fertilization to fail. To overcome weather-related crop failures, plant a few varieties known for their cold or heat tolerance—for example, 'Glacier' and 'Tropic' tomatoes. These are more likely to set fruit successfully under conditions that would cause a sensitive variety, such as 'Mortgage Lifter,' to shed most of its blossoms.

Insect Pollination

To produce fruit, about 35 percent of food crops require repeat visits by insect pollinators, such as bees, wasps, butterflies, flies and beetles—any creature that will crawl into the blossom, transfer pollen from the male anthers to the female stigma, and then move on to do the same to another flower. The pollen grains of insect-pollinated crops are sticky for easy transport, and many plants adver-



Water features, a resident beehive and a diversity of colorful blooms invite pollinators aplenty into a garden.

tise for pollinator services with colorful flowers—visual billboards promising a sweet drink of nectar, some nutritious pollen and occasionally a safe place to sleep. Case in point: Male squash bees hide away inside bright orange squash flowers late in the day, and then the blossom closes up around the sleeping bees as night falls, protecting them from predators. Inside, the bees' movements ensure that pollen spreads throughout the flower and all over the bees. In the morning, the guys are rested and the squash flowers are nicely pollinated.

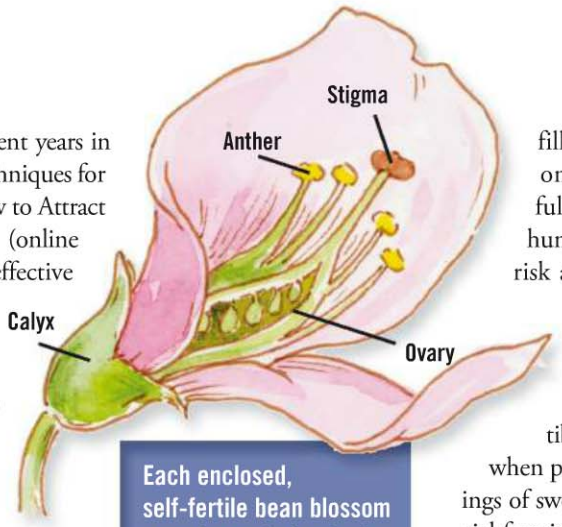
Most flowers have not one but dozens—or even hundreds—of ovaries that need to be fertilized, so pollination usually takes place over two to three days. In any seed-bearing fruit or vegetable, each seed represents a fertilized ovary. All the little seeds on strawberries result from 16 to 25 visits by pollinating insects. In comparison, because of differences in flower design, only half as much pollinator activity is needed to produce a watermelon containing hundreds of ripening seeds.

We recently asked the Mother Earth News Facebook community to dish on pollinator activity in their gardens. People with beehives (or, in the northernmost United States, more cold-hardy mason bee boxes) said pollination couldn't be better, and gardeners who went out of their way to grow borage, catnip and other bee-friendly flowers also reported ample buzzing in their gardens. Alarmingly, however, many long-term growers from about a dozen different states reported seeing fewer and fewer bees and other pollinators year after year. Some said they have been

Plant corn and other wind-pollinated crops in large blocks instead of in rows to achieve adequate pollination and a good harvest.

The blossoms of some self-fertile crops, such as beans and tomatoes, benefit from a good "buzz" from pollinators, such as bumblebees.

forced to hand-pollinate squash in recent years in order to get a harvest. Find detailed techniques for encouraging native pollinators in "How to Attract Native Bees to Your Organic Garden" (online at *http://goo.gl/dFQ3Zx*). The most effective strategy is simple: Grow as many nectar-producing flowers as you can fit into your garden, because pollinators can't resist the sweet, nutritious treat of nectar.



Each enclosed, self-fertile bean blossom contains male (anther) and female (stigma) reproductive parts.

Wind Pollination

Wind-pollinated plants don't need insects to move pollen to where it needs to go. Instead, they produce large amounts of smooth, dry pollen grains befitting of air travel. Corn, wheat, and other grains and grasses are primarily wind-pollinated, as are crops in the spinach family. Pollination won't affect your spinach harvest because you'll eat only the leaves—but it would affect any seed-saving efforts.

For wind pollination to work well, several plants must grow close enough together that pollen gets released in drifting clouds. That's why corn should always be planted in blocks rather than in long, single rows. With corn, every silk that emerges from the tip of the ear leads to an ovary, or future kernel. To form a well-filled ear, fresh pollen grains must land on hundreds of silks and then successfully germinate and grow long tubes to hundreds of receptive ovaries. Rather than risk a poor harvest, many gardeners with small corn plantings hand-pollinate to make sure they get completely developed ears.

Wind-pollinated crops are susceptible to pollen pollution—for example, when pollen from field corn blows into plantings of sweet corn. Organic growers in commercial farming areas face the inflow of pollen from genetically modified corn. Windbreaks composed of trees or hedges of tall sunflowers or sorghum reduce incoming alien pollen, as does a planting distance of several hundred feet. Also try planting times that are at least two weeks earlier or later than those of nearby commercial farmers.

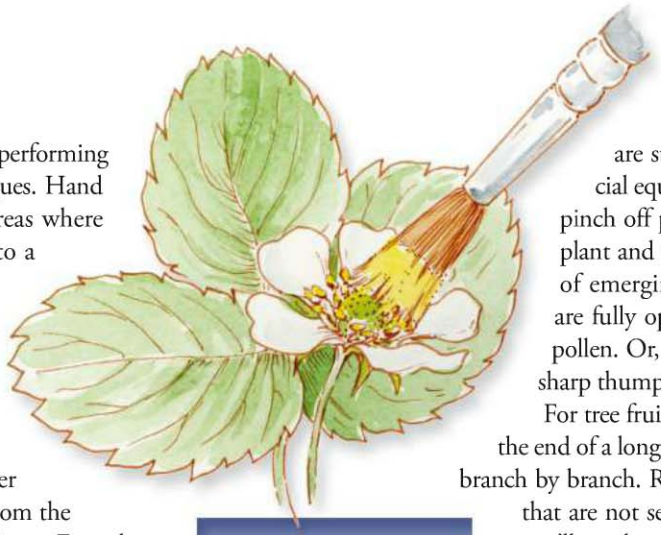
Hand-Pollination Tips

In small gardens, pollination of many crops may fall short because of too few insect-attracting flowers. If, for example, you have fewer than four plants of a cucurbit cousin—such as cucumbers, squash and pumpkins—or only a small plot of corn, you

Troubleshoot Plant Pollination Problems

The crop groups below are ready for harvest after seeds have set, so good pollination has a direct effect on the size and quality of the harvest.

Plant Family	Pollination Type	Effects of Inadequate Pollination	Gardener Interventions
Beans	Self-fertile; in some varieties, buzz pollination from insects will increase pod size and number of seeds.	Flowers come and go, but few pods develop.	Time plantings so plants don't bloom in high heat. Vibrate blossoms or gently shake plants to mimic visits by bumblebees.
Corn	Wind-pollinated, with some minor assistance from insects that knock pollen from the tassels.	Ears are stubby, with many missing kernels and no kernels near the tip.	Plant in large blocks if possible. For small plantings, tap pollen from tassels onto silks each morning for a week.
Cucumbers and squash	Insect-pollinated; male and female parts are located on different flowers; some cukes produce self-fertile female flowers.	Fruits shrivel when young, starting at the blossom end.	Grow flowers to attract native pollinators. Hand-pollinate by transferring pollen from male to female blossoms.
Strawberries	Pollinated by bees, flies and other insects as they crawl about on the flowers.	Berries don't develop fully; they're small and puckered.	Grow flowers to attract native pollinators. Hand-pollinate berry blossoms with a feather or dry paintbrush.
Tomatoes and peppers	Self-fertile; buzz pollination will improve fruit set and size.	Plants develop angular, hard-sided fruits with dry pockets inside where seeds should be.	Grow bumblebee-attracting plants. Vibrate blossom clusters to mimic visits by bumblebees. Grow cold- or heat-tolerant varieties if needed in your climate.
Tree fruits	Wind- and insect-pollinated; insects are essential to pollinate trees that don't produce self-fertile blossoms.	Few fruits set, fruits are small and slow to ripen, or fruit only grows on isolated branches.	Plant more than one variety for species that require cross-pollination. Grow flowers to attract native pollinators. Hand-pollinate with a tuft of dry feathers on a stick.



You can use a small, dry paintbrush to hand-pollinate a petite strawberry patch.

can greatly improve fruit set by performing simple hand-pollination techniques. Hand pollination is also helpful in areas where drought or pesticides have led to a shortage of insect pollinators.

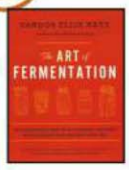
A dry paintbrush or a feather is the only tool you'll need to hand-pollinate strawberries and other plants that insects normally pollinate. For such crops, a few dabs with either implement will transfer pollen from the male to the female parts of each flower. For cukes and squash, you'll need to gather a few newly opened male blossoms (which are borne on bare stems) and touch the pollen to the female flowers (which have a tiny round fruit at their base). To mimic bumblebees' buzz-pollination of eggplants, peppers or tomatoes, hold the blossom or blossom cluster and then touch the back of a vibrating toothbrush or a bladeless electric razor to the stem for a few seconds.

Small plots of sweet corn will produce excellent ears if they're hand-pollinated in the mornings, when pollen is fresh and silks are stickiest. Doing so requires no special equipment. Every day for a week, just pinch off pieces of tassel from the top of the plant and tap them over the moist, new silks of emerging ears. Do this when the tassels are fully open and beginning to shed yellow pollen. Or, on still mornings, give the stalks a sharp thump with your hand to release pollen.

For tree fruits, use a tuft of feathers attached to the end of a long stick to tickle each blossom cluster, branch by branch. Repeat daily for a week. For species that are not self-fertile, such as most apple trees, you'll need to move pollen from one tree to another. Gather excess secondary blossoms from a pollinizer variety (a variety that produces sufficient pollen) in a paper bag, and dip the feathers in the bag of blossoms to then apply to the blossoms of the tree you're pollinating. Or, try this: Crab apples are good pollinizers and can pollinate other apple trees. Cut a bunch of blossom-laden crab apple branches, put them in a 5-gallon bucket of water, and then place the bucket inside the canopy of another apple tree. Bees will visit the crab apple blossoms and transfer the pollen to your apple blossoms.

BUZZ-TASTIC GUIDES Discover how to make your garden a haven for bees and other pollinators at *www.MotherEarthNews.com/Pollinators.*

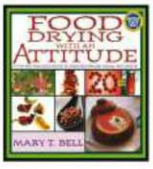
real food



THE ART OF FERMENTATION

The Art of Fermentation is an in-depth, comprehensive guide to do-it-yourself home fermentation. Sandor Katz presents the concepts and processes involved in fermentation in ways that are simple enough to guide readers through their first experience making sauerkraut or yogurt, yet detailed enough to also provide greater understanding and insight for experienced practitioners.

#6077 $39.95



FOOD DRYING WITH AN ATTITUDE

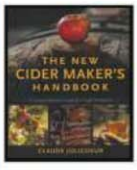
With more than 30 years of food-drying experience, Mary Bell offers straightforward and practical instructions for drying everything from yogurt to sauerkraut to blue cheese, without ignoring traditional favorites such as jerky, mushrooms and bananas. Readers will also find innovative and delicious recipes for cooking and baking with dried foods.

#3831 $12.95

LARD: COOKING WITH YOUR GRANDMOTHER'S SECRET INGREDIENT

Showing up at high-end restaurants and pastry shops, lard is once again embraced by chefs, dieticians and enlightened health care professionals. *Lard: The Lost Art of Cooking With Your Grandmother's Secret Ingredient* offers you the opportunity to whip up traditional recipes and incorporate good animal fat into your diet once again.

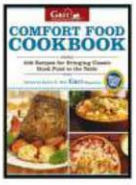
#5901 $24.99



THE NEW CIDER MAKER'S HANDBOOK

This book will appeal to both amateur and professional cider makers who want to increase their knowledge, as well as to orchardists who want to grow cider apples for local or regional producers. Novices will appreciate the overview of the cider-making process, and, as they develop skills and confidence, the more in-depth technical information will serve as an invaluable reference that will be consulted again and again.

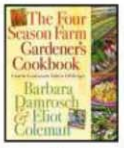
#6911 $44.95



COMFORT FOOD COOKBOOK

Bring tasty, old-fashioned comfort food to your table at every meal with the *Comfort Food Cookbook*, a collection of more than 230 recipes from the archives of *Grit*, a long-running country-lifestyle magazine. Discover how easy it is to make delicious biscuits, cornbread and other classic family favorites with wholesome ingredients.

#7289 $24.99



THE FOUR SEASON FARM GARDENER'S COOKBOOK

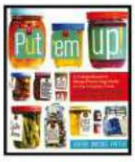
The Four Season Farm Gardener's Cookbook is two books in one. It's a year-round, seasonal cookbook with 120 recipes to maximize the fruits (and vegetables!) of your gardening labor. It's also a step-by-step garden guide full of easy-to-follow instructions and plans for different gardens. It covers properly sizing a garden, nourishing the soil, and the importance of rotating crops and planning ahead.

#6545 $22.95

MEALS IN A JAR

Meals in a Jar provides step-by-step, detailed instructions needed to create all-natural breakfast, lunch and dinner options that you can keep on a shelf and enjoy at any time. These scrumptious recipes allow even the most inexperienced chefs to serve gourmet dishes. Not only are these meals perfect for after-school study sessions and rushed evenings, they make for tasty fare on family camping trips and can be lifesavers in times of disaster.

#6657 $15.95



PUT 'EM UP

The step-by-step instructions in *Put 'Em Up* will have even the most timid beginners filling their pantries and freezers with the preserved goodness of summer in no time. An extensive techniques section includes complete how-to for multiple preservation methods: freezing, air- and oven-drying, cold- and hot-pack canning, and pickling.

#4560 $19.95

CURING AND SMOKING: MADE AT HOME

Curing and Smoking demonstrates how simple it is to use the magic of smoke to create wonderfully aromatic foods with distinctive flavors. The book follows the curing and smoking processes from beginning to end, from creating a useful pantry to storing your home-cured creations. Topics covered include drying, curing, hot smoking, cold smoking, indoor smoking, drying and wrapping, and vacuum packing.

#6215 $19.95

HOME CHEESE MAKING

Discover 75 recipes for making your own cheese and other dairy products that require only basic techniques and the freshest of ingredients. You'll enjoy the satisfaction of turning out a coveted delicacy, and then using your homemade cheese in the book's recipes, which include treats such as Ricotta Pancakes, Cream Cheese Muffins and more.

#1660 $16.95

THE NEW ARTISAN BREAD IN FIVE MINUTES A DAY

Jeff Hertzberg and Zoë François have completely revamped their first, most popular and now-classic book, *Artisan Bread in Five Minutes a Day*. Responding to their thousands of ardent fans, they returned to their test kitchens to whip up more delicious baking recipes. This revised edition includes more than 30 brand-new recipes, including Beer-Cheese Bread, Crock-Pot Bread, Panini, Pretzel Buns, Apple-Stuffed French Toast, and many more.

#7344 $29.99

ROOT CELLARING

Anyone can learn to store fruits and vegetables safely and naturally in a cool, dark space with the step-by-step advice in this book. Root cellaring is a way of using the earth's naturally cool, stable temperature to store perishable fruits and vegetables and preserve them for months to come. This book will show you a no-cost, simple, low-tech, energy-saving way to keep your harvests fresh all year long.

#539 $14.95

natural health

500 TIME-TESTED HOME REMEDIES AND THE SCIENCE BEHIND THEM

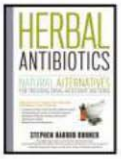
Covering everything from insect bites and insomnia to nausea and stress, this authoritative and comprehensive guide offers easy recipes to bolster your resistance to illness, and the scientific backup as to why and how the solutions are effective. It shows how to ease aches and pains and manage minor ailments naturally. The book's 500 recipes contain readily available, inexpensive and safe ingredients.

#7017 $21.99

HANDS-ON HEALING REMEDIES

Author Stephanie Tourles offers 150 original recipes for herbal balms, oils, salves, liniments and other topical ointments you can make yourself to treat a wide range of conditions, from headaches and backaches to arthritis, tendonitis, fungal infections, anxiety, cuts and scrapes, insomnia, splinters, cracked skin, and more.

#6496 $18.95



HERBAL ANTIBIOTICS

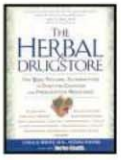
In this empowering book, Stephen Buhner offers conclusive evidence that plant medicines, with their complex mix of multiple antibiotic compounds, are remarkably effective against drug-resistant bacteria. You'll learn how herbal antibiotics, such as aloe, garlic and grapefruit seed extract, represent our best defense against bacteria and how their use will ensure that antibiotic drugs will still be effective when we really need them.

#4667 $24.95

ORGANIC BODY CARE RECIPES

Discover the joy and fun of crafting your own personalized body care products using herbs and other natural ingredients that nourish, pamper, cleanse and protect the skin without using irritating or harmful chemicals. In just minutes, you can whip up dozens of organic treatments that will make your face radiant, your skin glow, your hair shine, and your hands and nails beautiful.

#5374 $18.95



THE HERBAL DRUGSTORE

A treasure trove of knowledge, this 610-page book was one of the first to cover how to replace specific conventional medications with herbal equivalents. Arranged by ailment, herbal alternatives are offered for more than 500 prescriptions and over-the-counter drugs. More than 100 ailments are covered, and an encyclopedia details more than 70 medicinal herbs.

#1872 $22.99

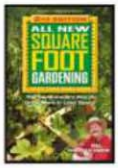
ROSEMARY GLADSTAR'S MEDICINAL HERBS

More than 30 of the most common and versatile healing plants are profiled in this respected guidebook. Author Rosemary Gladstar explains how to grow, harvest, prepare and use the plants to make your own herbal remedies for common ailments, such as lotion for poison ivy, lavender-lemon balm tea for stress relief, and more. Stock your home's medicine chest with safe, all-natural, low-cost herbal preparations to enjoy better health.

#5948 $14.95

To order, call toll-free 800-234-3368 (outside the United States and for customer service, call 785-274-4365), or go to *www.MotherEarthNews.com/Shopping.* Mention code MMEPAEA2.

organic gardening



ALL NEW SQUARE FOOT GARDENING (2ND EDITION)

Rapidly increasing in popularity, square foot gardening is an easy way to grow a lot of food in small spaces. Rich with full-color images and tips for selecting materials, this book is perfect for brand-new gardeners as well as the millions of square foot gardeners who are already dedicated to Mel Bartholomew's industry-changing insights.

#6645 $24.99

THE FORGOTTEN POLLINATORS

The Forgotten Pollinators explores the vital but little-appreciated relationship between plants and the animals they depend on for reproduction: bees, beetles, butterflies, hummingbirds, moths, bats and countless other animals—some widely recognized and others almost unknown.

#6597 $33.00

THE ORGANIC GRAIN GROWER

The Organic Grain Grower is invaluable for both home-scale and commercial producers interested in expanding their resiliency and crop diversity by growing grains. In addition to detailed cultivation and processing information, author Jack Lazor argues that integrating grains on the organic farm is important to improve biodiversity and succeed in whole-farm management.

#6756 $45.00

ATTRACTING BENEFICIAL BUGS TO YOUR GARDEN

While it may seem counterintuitive to want insects in your garden, many species are valuable, beneficial plant companions. In addition to information on companion planting and commercial options for purchasing insects, there are 19 detailed bug profiles and 39 plant profiles. This complete, hands-on guide is for anyone looking for a natural and sustainable way to control pests and improve pollination.

#7004 $24.95

THE GARDEN PRIMER (2ND EDITION)

The most comprehensive and entertaining single-volume gardening reference ever printed now focuses on 100 percent organic methods. This updated version of Barbara Damrosch's classic guide rejuvenates the original material while maintaining its primary appeal: practical, creative ideas and the friendly style of an "old-fashioned dirt farmer."

#3896 $18.95

SAVING SEEDS AS IF OUR LIVES DEPENDED ON IT

This book offers great guidance for beginning and experienced seed savers alike on the joy and responsibility of preserving seeds. The history of seed saving comes with an overview of the current state of seed affairs, and the endless benefits of choosing the "seedy road."

#5775 $12.00

BEES, WASPS, AND ANTS

Few insects are more important than bees, wasps and ants. They maintain the garden's biological balance, fertilize vegetables, fruits and flowers, and recycle nutrients within the soil. *Bees, Wasps, and Ants* explores the importance of the Hymenoptera order and explains how gardeners can encourage (or discourage) them in the garden.

#6683 $27.95

GARDEN WISDOM & KNOW-HOW

Garden Wisdom and Know-How is a practical guide to planting and maintaining a large-scale garden. The chapters are organized by topic—garden techniques and tricks, the flower garden, the edible garden, container gardening, garden design and landscaping, attracting wildlife, and more—and packed with useful information.

#4522 $19.95

VERTICAL VEGETABLES & FRUIT

For anyone who wants to grow food in small spaces, this book has the solution: Grow up! Learn how to construct the site, prepare the soil, and plant and care for vegetables and fruit to produce big yields. From beans on a tipi and tomatoes on a wire archway to cucumbers on a trellis and kiwis on a clothesline, author Rhonda Massingham Hart has advice to meet every gardener's needs.

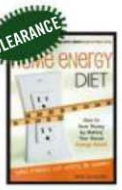
#5857 $16.95

Green Homes

COMPACT CABINS

This book includes 62 designs for cabins ranging from 150 to 1,000 square feet, all of them affordable, comfortable and energy-efficient. For each design, you'll find detailed floor plans as well as innovative suggestions for how to take advantage of every square inch. The plans are flexible and feature modular elements that can be mixed and matched to suit your needs.

#4436 $19.95



THE HOME ENERGY DIET

The Home Energy Diet is designed to help readers take control of their personal energy usage and costs so they can save money, live more comfortably and reduce their environmental impact. Energy auditor Paul Scheckel first explores energy literacy, and then describes how your home uses and loses the energy you purchase, through electricity, hot water, heating and air conditioning, windows, walls, and insulation.

#2357 ~~$18.95~~ $6.00

TINY HOMES: SIMPLE SHELTER

Many people are rethinking their ideas about shelter and seeking an alternative to high rent or a lifelong mortgage. This stunning book spotlights some 150 builders who have taken home-building into their own hands by creating tiny homes (smaller than 500 square feet). Illustrated with 1,300 photos, *Tiny Homes* reveals a rich variety of small homemade shelters and shares the stories of owner-builders who embarked down the path toward downsizing and self-sufficiency.

#5972 $28.95

COMPACT HOUSES

Discover the huge possibilities to be found in a small house! Whether you're building from scratch or retrofitting an existing structure, these 50 innovative floor plans will show you how to make the most of houses measuring 1,400 square feet or less. Author Gerald Rowan focuses on efficient layouts and creative ways to use every inch of your space, including closets, desks, porches, bathrooms, attics and basements.

#6863 $19.95

THE HOMEOWNER'S ENERGY HANDBOOK

Whether you want creative solutions to button up your house to make it more energy-efficient, ways to achieve deep energy savings or ideas to take your home entirely off the grid, this guide has the knowledge and skills you need. You'll find information from the easiest and most effective ways to reduce your use, then produce!

#6654 $24.95

TINY HOUSE LIVING

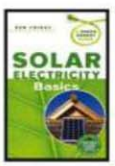
This book explores the philosophies behind the tiny house lifestyle, helps you determine whether it's a good fit for you, and guides you through the transition to a smaller space. For inspiration, you'll meet tiny house pioneers and hear how they built their dwellings (and their lives) in unconventional, creative and purposeful ways. They'll invite you in, show you around their cozy abodes, and share lessons they learned along the way.

#7323 $26.99

DIY SOLAR PROJECTS

Advances in solar technology have made many DIY-friendly products available to consumers. Included in this book are step-by-step projects—such as solar water heaters, solar battery charging stations, solar-powered lights, photovoltaic shingles that provide supplementary electricity, solar heat pumps, and solar panel kits—that will help you reach your renewable-energy goals.

#5594 $21.99



SOLAR ELECTRICITY BASICS

Solar Electricity Basics provides a clear understanding of the sun, solar energy and solar-electric systems. It discusses the theoretical, practical and economic aspects of residential solar installations, including inverters, batteries and controllers, costs of solar-electric systems, financial incentives, system installation and maintenance, permits, covenants, utility interconnection, and buying a system.

#4542 $12.95

ZERO WASTE HOME

In *Zero Waste Home*, Bea Johnson shares the story of how she simplified her life by reducing her waste. This book shares essential how-to advice, secrets and insights based on Johnson's experience. She demystifies the process of going Zero Waste with hundreds of easy tips for sustainable living that even the busiest people can integrate: from making your own mustard to packing kids' lunches without plastic, from cancelling your junk mail to enjoying the holidays without the guilt associated with overconsumption.

#6822 $17.00

homesteading and **livestock**

THE BACKYARD BEEKEEPER

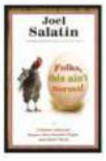
The Backyard Beekeeper makes the time-honored and complex tradition of beekeeping an enjoyable and accessible hobby. More than a guide to beekeeping, this is also a handbook for harvesting the products of a beehive and a honey cookbook—all in one lively, beautifully illustrated reference.

#2422 $24.99

EDIBLE MUSHROOMS: SAFE TO PICK, GOOD TO EAT

Wandering the woods in search of mushrooms is one of life's great pleasures—but be careful to pick the right ones! With *Edible Mushrooms* in your backpack, you'll be able to identify safe and delicious chanterelles, truffles, morels, and more. Author Barbro Forsberg presents 40 edible species and reveals how, when and where to find them—knowledge gained over the course of four decades spent mushrooming in the woods.

#7123 $16.95



FOLKS, THIS AIN'T NORMAL

In *Folks, This Ain't Normal*, Joel Salatin discusses how far removed we are from the simple, sustainable joy that comes from living close to the land and the people we love. Salatin has many thoughts on what "normal" is, and he shares practical and philosophical ideas for changing our lives in small ways that can have big impacts.

#5743 $25.99

LITTLE HOUSE OFF THE GRID

Cam and Michelle Mather longed for a simpler, quieter life in the country. When they found a century-old farmhouse on 150 acres of land that was in their price range, they jumped at the chance to make their move. Twenty years later, they have acquired new skills and knowledge, and most importantly, they learned to appreciate the value of good neighbors, good books and good manure.

Discount available until Nov. 31, 2014.

#5767 ~~$19.95~~ $14.96

POSSUM LIVING

In *Possum Living: How to Live Well Without a Job and With (Almost) No Money*, author Dolly Freed shares why she decided to shun the rat race and live off the land on a half-acre lot outside of Philadelphia. Originally published in the late 1970s, Possum Living is part philosophical treatise and part down-to-earth how-to, and provides a no-nonsense approach to beating the system and becoming self-sufficient—even in suburbia.

#4513 $12.95

THE SMALL-SCALE POULTRY FLOCK

Get all the information you need for raising, brooding and breeding poultry at home, plus learn how to use poultry as insect and weed managers in your garden or orchard. Harvey Ussery presents an entirely sustainable system that can be adapted and used on a variety of scales, and that will prove invaluable for beginning homesteaders, growers looking to incorporate poultry, or poultry farmers seeking to become more sustainable.

#5575 $39.95

THE BEGINNER'S GUIDE TO BEEKEEPING

Beginning with the basics, seasoned beekeepers Daniel and Samantha Johnson answer common questions that a prospective beekeeper would have on how to set up and care for hives and then harvest and process the sweet rewards. With the help of this comprehensive DIY guide, raising bees can be an enjoyable and accessible backyard pastime for gardeners, crafters and cooks everywhere.

#6895 $19.99

THE ENCYCLOPEDIA OF COUNTRY LIVING

The essential resource for modern homesteading, *The Encyclopedia of Country Living* covers how to cultivate a garden, buy land, bake bread, raise farm animals, make sausage, can peaches, milk a goat, grow herbs, churn butter, build a chicken coop, cook on a woodstove, and so much more!

#6733 $29.95

FREE-RANGE CHICKEN GARDENS

Many gardeners fear chickens will peck away at their landscape, and chicken lovers often shy away from gardening for the same reason. But you can keep chickens and have a beautiful garden, too! In this essential handbook, everything a gardener needs to know is included: from chicken-keeping basics and simple garden plans to get you started to the best and worst plants. You'll find step-by-step instructions for getting your chicken garden up and running.

#5913 $19.95

MAXIMIZING YOUR MINI FARM

Keep your costs down and production high with this complete guide to maximizing your mini farm, whether it's a rooftop urban garden, a suburban backyard or a more substantial plot of land. Materials, tools and techniques are detailed with tables, diagrams, and 200 color illustrations and photographs.

#6059 $18.95

PROJECTS TO GET YOU OFF THE GRID

With *Projects to Get You Off the Grid*, the Instructables community of do-it-yourselfers have pooled their knowledge into a compact book focused on a series of projects that will get you thinking creatively about thinking green. This collection of 20 projects illustrates just how simple it can be to make your own backyard chicken coop or to turn a wine barrel into a rainwater collector.

#6917 $14.95

THRIVING DURING CHALLENGING TIMES

Thriving During Challenging Times is meant to serve as your handbook to energy, food and financial independence during this difficult era of rising oil costs, economic crisis, water shortages and climate change. This book is a road map to making your home more independent, getting your bank account back on track, and discovering that digging potatoes for dinner or showering in water heated by the sun can provide the greatest of satisfactions.

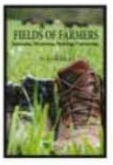
Discount available until Nov. 31, 2014.

#4330 ~~$19.95~~ $14.96

COUNTRY WISDOM & KNOW-HOW

This 476-page book is a compendium of treasured knowledge from hundreds of small booklets published as "Country Wisdom Bulletins" in the 1970s. Whether you want to build a stone fence, make strawberry-rhubarb jam or plant an herb garden, this book will explain how to make your homesteading dreams a reality.

#2793 $19.95



FIELDS OF FARMERS: INTERNING, MENTORING, PARTNERING, GERMINATING

The average U.S. farmer is 60 years old, largely because young people can't get into the business, which means old people can't get out. Based on his decades of experience at Polyface Farm, Joel Salatin digs deep into the problems and solutions surrounding this land- and knowledge-transfer crisis. *Fields of Farmers* empowers aspiring young farmers, midlife farmers and nonfarming landlords to build regenerative, profitable agricultural enterprises.

#6831 $25.00

KEEPING BEES & MAKING HONEY

Whether you want to start a home-based beekeeping business or simply are interested in a new hobby, you'll become an expert in no time at all. Learn the history of bees and beekeeping and get the best advice available for safely collecting the honey and wax from your bees.

#4692 $19.99

THE MINI FARMING HANDBOOK

With full-color photographs, as well as step-by-step drawings, projects, graphs and tables, you'll have everything you need for your new or established mini farm at your fingertips. Dive into this handbook to learn how to begin and cultivate your own mini farm on less than a quarter-acre.

#7245 $14.95

THE SHEER ECSTASY OF BEING A LUNATIC FARMER

Shunned by industrial farmers, vilified by corporate agribusiness, and accused by food police of being a lunatic, farmer-entrepreneur Joel Salatin enjoys the sheer ecstasy of being surrounded by happy, frolicking animals, wriggling earthworms, and appreciative customers. This book describes the breadth and depth of the paradigm differences between healing and exploitative food systems.

#4808 $25.00

WOOD PALLET PROJECTS

Craftsman Chris Gleason combines sound woodworking techniques with a hip designer's sensibility to unleash the limitless possibilities of the common skid. *Wood Pallet Projects* shows how anyone can upcycle salvaged pallet wood to create truly one-of-a-kind projects. Inside you'll find 15 projects for upcycling ordinary pallet wood into objects such as a side chair, wine rack, picnic table, toolbox, workbench, and more.

#6633 $19.99

Fighting for a SANE FOOD SYSTEM

Choosing local, organic fare and cooking from scratch don't make you a "food snob." They mean you're conscientious.

We live in a world of sound bites. The in-depth discourse that dominated pre-television days is in short supply in our impatient, hurried-up world. If you disagree with someone, that person frequently pays attention for about one minute before dismissing your argument. If you can't score your point in that time, the conversation moves on.

Those of us who care about the food system have plenty of wrong-headed thinking to counter these days—and we need to be able to present our arguments quickly. One common and extremely frustrating misconception I encounter is that my approach to sustenance makes me a food snob. I'm viewed as some sort of elitist if I spend my food dollars on local, compost-fertilized produce and pasture-based meats. But spending $20 or $30 on a meal of low quality and lousy nutrition is somehow seen as normal.

An egregious example of this way of thinking appears in the blockbuster documentary *Food, Inc.* when a family of four—husband, wife and two teenagers—stops at Burger King for super-sized dinners and then laments their inability to afford fresh produce at the supermarket. Although I haven't been to Burger King in 35 years, a quick online search reveals roughly how much that meal would have cost. With the super-duper soft drinks, fries and deluxe burgers, each of those meals would have cost at least $8, or a minimum of $32 for the family.

Growing vegetables—even on rooftops—is one way to make healthy food affordable.

For that amount of money, that family could have purchased a pound of our farm's grass-fed beef—a premium, world-class ground meat—plus buns, the fixin's and potatoes for some french fries, and everyone could still have enjoyed a great-tasting quarter-pounder and fries. I guarantee you that a pound of our ground beef contains more good nutrition than that family's Burger King meal. This is not to pick on Burger King nor its customers. I don't begrudge people eating there; what I begrudge is people eating there because they think it's cheap and convenient, and then telling me they can't afford my product because it's expensive and inconvenient.

The result is a victim mentality that permeates every food discussion. The idea that people can't afford good food is practically axiomatic in our collective thinking. Because the sticker price of my food—which I'm calling "integrity food"—is often more than the sticker price of industrial fare, I'm tempted to react apologetically, head down, guilty as charged. I define integrity food as food that's raised in a way that heals the environment and builds the soil, creating sustenance that's nutrient-dense and life-affirming—including for the lives of the humans who raise, process *and* consume it. And even though we know that's a worthy context for our farming and market gardening, a lot of us in this integrity-

food movement are sometimes apologetic and even allow ourselves deep down to be swayed by that "I can't afford good food" mentality.

So I've been thinking: Can we of the integrity-food persuasion sound-bite our way into altering the conversation about the price of food? Can we articulate a charitable, inoffensive answer that challenges this allegation of elitism? I don't know whether I have an answer, but I have some proposals I'd like to try on for size. Each sound bite is meant as an inquiry, not an assault, intended to invite deeper thinking whenever we're faced with the accusation of food snobbery or the automatic assumption that quality food is expensive food and therefore out of reach for ordinary people.

Home-cooked, organic hamburger dinner: Quarter-pound burger, french fries, applesauce and milk; $4.90 each = $19.60 to feed four people

Burger King non-organic Whopper Meal: Whopper with medium fries and medium soft drink; $7.88 each = $31.52 to feed four people

Can You Separate Your Needs From Your Wants?

Most people think their purchases are wise and necessary, but I've found that nearly everyone makes routine purchases that are actually choices rather than necessities. In no particular order, here are some I've observed:

- Starbucks (one $5 coffee drink or latte each work day adds up to about $1,255 annually)
- Alcohol
- Designer jeans
- Tobacco
- Lottery tickets

We can stop the list there, but you get the idea. People are far quicker to assume they have no choice than they are to examine their spending and discover what's discretionary—an amount that is usually significant.

I've often found the discussion about integrity-food prices derailed immediately because we don't have an answer that addresses the fraction of our population living in hardship. We should instead focus the discussion on the majority of people who routinely buy unnecessary things and then claim good food is too expensive.

The saying "Pick the low-hanging fruit first" applies here. Certainly hardship does exist, but let's deal with the discretionary stuff—the easy picking—first. Letting the discussion veer to the most dire cases of hardship without appreciating how many people actually can choose to change is like refusing to pick apples from a tree until we've figured out how to pick all the apples at the tippy-top. We need to keep the conversation targeted to the doable first.

Do You Cook From Scratch?

The notion that processed food is cheap and integrity foods are prohibitively expensive is simply not true. I was at the Greenmarket in New York City a couple of years ago, one of the most elite artisanal food markets in the U.S. I asked my host to show me the most expensive potatoes there.

She took me to a potato vendor whose display looked like it should have been in the Museum of Modern Art. Roughly 1-foot-square, partitioned wooden boxes held some 20 varieties of potatoes. Round, long, gnarly, red, yellow, white, blue—the colorful arrangement was truly a masterpiece of bounty and variety. I looked over the display and found the most expensive potato, a blue fingerling for $2 a pound. Follow me here—this was the most expensive organic heirloom potato in one of the most expensive food markets in the United States. How many potatoes in your neighborhood supermarket sell for at least twice that price—as potato chips? For example, a 5-pound bag of organic 'Yukon Gold' potatoes sells for about $5.50, or $1.10 per pound; a 10-ounce bag of Lay's potato chips costs about $3.50, which is $5.60 per pound.

Processed food is expensive. If you price microwaveable boxes of frozen chicken nuggets or whatever, you'll find that they're much more expensive per pound than pastured, local whole chicken. And that's before we even begin the nutrition discussion.

Organic potatoes provide more food, at lower cost, with better nutrition and flavor than heavily processed potato products.

Ah, but to have potato chips at half the price of store-bought, you have to *prepare* that potato in your kitchen. I can hear the protests from here: "But I don't *want* to cook a chicken or a potato." That's what I mean by personal discretion. If you don't want to cook, fine. Just don't confuse not wanting to with not being able to.

The key to affordable food is to reclaim domestic culinary arts. Getting into your kitchen to prepare, process and preserve food is not being sentenced to the Dark Ages of hoop skirts, washboards

FOTOLIA/SARSMIS; TOP: MATTHEW T. STALLBAUMER; PAGE 67: BOTTOM: NEIGHBORHOOD RESTAURANT GROUP; TOP: RACHEL SALATIN

and open-hearth cooking. Today's kitchens are not like your great-grandma's. We have hot and cold running water that we don't even have to haul up from the creek. We have stainless steel, refrigeration, electric skillets and ovens that turn on faster than woodstoves. We have Cuisinarts, timed-bake ovens, bread machines, slow cookers and ice cream makers. Our modern kitchens are gadgetized up the wazoo. All of these conveniences are begging to be used—do you hear them chirping from the cupboards?

Is 'Convenience' Worth Its True Cost?

Time and money have always gone hand in hand, and the advice to cook at home gets into the "time" part of food's cost. My challenge for people to get into the kitchen usually results in an argument about not having enough time to prepare food. Often the protests come from parents who cart their children three hours each way to a sports tournament, stopping for Happy Meals because they don't have time to cook.

Again, let's separate choice from not being capable. We all make choices. The notion that we can build integrity into our food system without a cultural shift in behavior is fundamentally flawed. The choices are not really complicated, but quite worthwhile. Preparing a home-cooked meal with your family might allow you to get acquainted with each other in new ways. "Cheap food" might be the beans you bought in bulk, prepared ahead of time and froze as individual lunches. You might end up waiting to take your vacation until after the tomatoes have frosted—you'll still get the trip, plus bounty in the larder and food that won't go to waste.

Many modern, sophisticated Americans have abdicated their hands-on participation with food. The inevitable and obvious result is "foodstuff" that your great-grandma would not recognize. Another result of this abdication is ignorance about food—and we all know that ignorance breeds fear. Many people these days know nothing about where their food comes from and actually fear food: They're afraid to thaw a chicken and they're suspicious of butternut squash with a few dirt particles on the outside. When you start working with food, knowledge will replace ignorance and fear.

Do You Grow Your Own?

Certainly some folks have a hard time growing vegetables and fruits, but most places have room for some kind of garden. Thinking of getting a pet? Opt for two chickens to eat kitchen scraps and lay eggs in return—the cheapest and best food you can imagine.

Container gardening is handy and cool, as are stackable containers. Raised beds in the backyard with floating row covers over hoops that allow unprecedented season extension and on-site food integrity? Cooler still. How about selling your gigantic flat-screen TV and using the money to install a solarium on the south side of the house? Passive solar heat and hardy greens all winter instead of a steady stream of televised mayhem? A good trade.

Compost and perlite to grow veggies on the roof? Honeybees in the backyard? Gardens in every vacant urban lot? Edible landscaping? The solutions are endless. It doesn't take any more work to grow an apple tree than a flowering ornamental. Replace the roses with tomatoes. A do-it-yourself dinner can be the cheapest you'll ever have, and if it costs a few couch-potato hours, you've replaced a health liability with a health-giving asset.

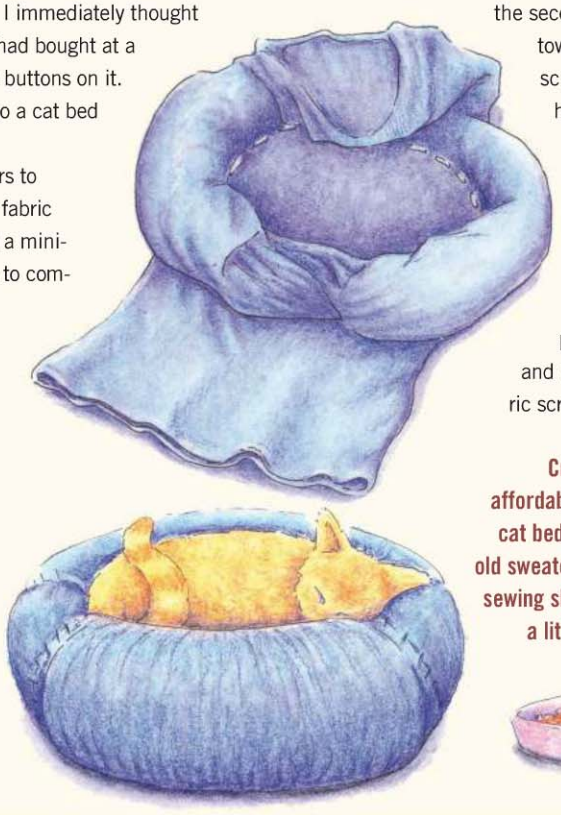
Asking to-the-point, sound-bite questions can help all of us engage constructively with opposing views. These are some that I've found helpful in the food-snob debate. I hope you can adapt them to focus your discussions about rebuilding integrity in our food system, to alter the conversation about affordable food, and to empower some of those "victims" who just *can't*.

Beloved "lunatic farmer" Joel Salatin is leading the charge for a sane food system. His most recent books are *Fields of Farmers: Interning, Mentoring, Partnering, Germinating*; *Folks, This Ain't Normal*; and *The Sheer Ecstasy of Being a Lunatic Farmer* (see Page 64 to order).

The Purr-fect Homemade Cat Bed

I saw a photo on Facebook that suggested turning an old sweater into a homemade cat bed, and I immediately thought of the purple 1980s sweater I had bought at a thrift store for the lovely, big purple buttons on it. I decided to convert the sweater into a cat bed and my cat, Izzy, adores it.

The bed only took about two hours to make, including the time to cut up fabric scraps for stuffing. You'll only need a minimum amount of sewing experience to complete this simple project.



Materials

Fabric scraps (for stuffing)
1 unwanted sweater
2 old towels
Wool thread
Needles
Scissors

Instructions

Cut your fabric scraps into small pieces. Fold the towels into squares so they're nearly the size you want for the base of your pet bed. Pile half of the fabric scraps on top of one square towel and then place the second towel over the scraps. Loosely sew the towels together in an oval shape, with the scraps contained within the oval—this will hold the two towel bases together. Turn the edges of the towel over, toward the inside of the circle, and loosely sew them in place. Your base should now be roughly oval-shaped.

Place the base of the pet bed inside the body of the sweater, and sew it in place with thick wool thread. Stuff the arms and neck of the sweater with the rest of the fabric scraps, tuck them around the base, sew them into place, and then fold the bottom of the sweater up and over the arms, stitching as needed. Embellish as desired!

Elizabeth Atia
Shetland, Scotland

Create an affordable, cozy cat bed with an old sweater, basic sewing skills and a little time.

To see step-by-step photos and more detailed instructions for this project, check out Elizabeth's Kitchen Diary blog at http://goo.gl/DgjR7x.

DIY Insulation Helps Lower Heating Costs

My mother and I made insulation "pillows" to better insulate our house's foundation during winter. We were successfully able to reduce the risk of our pipes freezing, lower heating costs and reduce wind flow under the house.

Our first step was to measure each of our foundation vents, because the interior sizes varied. We then purchased high-quality insulation, cut it to size, and folded it into pillow shapes. We wrapped the insulation pillows with shrink-wrap to make sure they held their shape. We placed our insulation pillows in the foundation vents and between the trusses in the vented area in the attic (of course, this was only after conferring with my contractor and HVAC engineer). The most important thing to remember is to add the pillows prior to the first freeze, and then remove them before spring to allow for proper ventilation.

Brandy Anderson
Old Fort, North Carolina

Grease On, Grease Off

Save the wrappers that sticks of butter come in and use them for greasing pans. This is a convenient and tidy way to get as much use from your butter wrappers as possible.

Krista Matias
Minneapolis, Minnesota

What a Nutty Idea!

Acorns are not often harvested and used for food, even though oak trees grow across the United States. Some large oaks can yield 1 to 2 tons of acorns—more than nearby wildlife could possibly eat.

Even though we don't eat many acorns in the United States, it's not a far-fetched idea. Processing acorns does take a decent amount of time because you have to remove the tannic acid, so do a bit of research about how to eat acorns before you dive in. You can roast acorns or grind them for flour or porridge. Koreans make noodles and other products with acorn meal. Algerians and Turks use acorns for oil, and Spaniards make sweets with them. Evidently, they don't find the processing too cumbersome!

Acorns keep well when refrigerated. In fact, Native Americans kept their acorns in bags submerged in cold streams for up to two years.

Barbara Brooks
La Vernia, Texas

To learn more about harvesting acorns, removing the tannic acid and using acorns as a sustainable food source, read "Acorn Nuts: The Grain That Grows on Trees" at http://goo.gl/mrK9CD. —*Mother*

Reusing Pumpkins

Last autumn, many downtown businesses wanted to get rid of the pumpkins they had used as Thanksgiving decorations. My family asked permission to bring the pumpkins home to our farm, where I immediately fed the seeds to our chickens. My girls loved the

ILLUSTRATION: BRAD ANDERSON

pumpkin seeds, which I understand are a natural dewormer.

My chickens weren't crazy about the actual raw meat of the leftover pumpkins, so I cooked chunks of pumpkin until they were soft. I added old potatoes, stale bread and other leftovers to the pot. After the pumpkin mixture cooled, I took it back to the chicken coop. Boy, did the chickens love that homemade, pumpkin-based chicken food!

We used the smaller pie pumpkins that we gleaned for pies, breads and pickled pumpkin. The large, curved pumpkin stems also make great hooks to screw on a wall; they last a surprisingly long time.

Dawn Hodges
Bellville, Texas

Pocket Change for Energy Efficiency

If you live on a tight budget, making changes for increased energy efficiency at home can be a challenge. I decided to upgrade to LED light bulbs, but then I saw they cost about $10 each. Because I needed 47 bulbs, I didn't see the change happening any time soon. But one day, I was rolling coins from our pocket-change jar and wondering what I could do with the money. Sometimes I have $30 to $70 in spare change. Then it hit me: I could use this change to buy LED light bulbs! I bought three bulbs at Lowe's for $36 and I love them. Then I decided, why stop there? After the bulbs, I can invest in insulated cellular shades, bathroom fans or ceiling fans. This change jar is now my energy-efficiency money. It's an investment in my home and the environment that will have long-term returns. That's what I call pocket "change"!

Jamie Thorp
Dawson Springs, Kentucky

Table for One

I know I'm not the only person gardening and cooking for one. I've learned that you don't have to give up eating well just because a recipe makes too much food. I make full-sized batches of most things, including biscuits and cookies, and then freeze half for later. Sausage gravy as well as chicken, ham and beef stocks work the same way. Pour them into ice cube trays, freeze, and then transfer to gallon freezer bags. Use a few cubes at a time. Two cubes of gravy are just right for one biscuit. A single cube of chicken stock in a pan of vegetables is way better than bouillon cubes, and it's a super flavor-enhancer for vegetable soups, too.

Tom Crain
via Facebook

Oh Deer! DIY Antler Furniture

Antlers of animals in the deer family are the fastest growing bone on earth, developing up to seven times quicker than skeletal bone. Most species shed their antlers annually. As a craftsperson, I enjoy merging the beauty of antlers with my woodworking projects to create one-of-a-kind pieces of homemade furniture.

The most gratifying piece of antler furniture that I've made is a Native American arrowhead-shaped coffee table. The walnut top, fashioned from a single slab of tree root, highlights the same tight, contorted grain found in expensive gun stocks. The base is composed of antlers from whitetail, mule and axis deer as well as elk and moose. In the center of the table is a 5-inch arrowhead complemented on either side by an inset ceramic drink coaster sporting the profiles of a deer and an elk.

This arrowhead-shaped coffee table is made from a slab of walnut root and a collection of antlers.

Les A. Davenport
Clayton, Illinois

An Easy Way to Store Garden Tools

Use discarded wood pallets to store garden tools, pipes, lumber and more. I got mine at a paint store, but you can get free pallets next to dumpsters at a variety of retail stores, discarded by the side of the street, or from *www.Freecycle.org*. I find this idea extremely "pallet-able"!

Kirk Miller
Richardson, Texas

Water Plants With Used Aquarium Water

If you have an aquarium, consider the value of the wastewater you siphon off every time you clean it. One of the best things you can do with this nutrient-rich fish water is to offer it to your plants, both indoors and out. Organic, nitrogen-rich aquarium wastewater can give your plants a nutritious boost any time of the year. Plus, it's already diluted, so you won't have to worry about it burning your plants.

Sheryl Normandeau
Calgary, Alberta

Double-Duty Shower Caddy

After I replaced my shower head, the caddy that I had been using for shampoo and soap no longer fit. Rather than throwing it away, I attached it to the side of my kitchen cabinet. I now use the shower caddy in the kitchen so my dishcloths and sponges can dry with good air circulation rather than lying on the damp sink. I even placed a plastic soap dish on the bottom to catch drips.

Tammy Bennett
Wickenburg, Arizona

Put It on the Card

Credit card offers in the mail often contain an example plastic credit card with contact information to open your "preapproved credit account." These plastic cards make excellent, disposable pan- and window-scrapers and glue-spreaders. Let your imagination run free and you'll find more uses for them.

Lane Hug
Dover, New Hampshire

Step It Up a Notch

When it came time to replace the wooden stairs that led to my home, I wanted to find another purpose for the old wood. I decided to turn the stairs into two raised garden beds. I left one of the stairs in its original form, to lay flat for sitting on or to function as a small work surface.

Melanie Martinez
Marana, Arizona

Take the Plunge

A great way to protect your hands and still hand-wash fragile clothes in a tub or sink is to drill quarter-inch holes in the rubber of a sterilized toilet-bowl plunger. As you plunge down, the soapy water will come through the holes and create a great washing action. You'll be amazed at how quick and easy this makes hand-washing clothes, and also at how clean your garments will come out. My "washers" have already lasted many years and they show no signs of giving out anytime soon. These washers are traditionally called "possers," and I keep one in my laundry room and one in my bathroom.

Frances Sweeney
Greenbank, Washington

'Number Two' Taboo

I did an online search for "recycled toilet paper" and found that a growing number of people are turning to the "family cloth." This solution to bathroom paper waste makes sense to me.

We use rags to wash all parts of our bodies. I used cloth diapers and cloth wipes on my babies, and I use cloth menstrual pads, so why not take it one step further? If we really want to make a positive impact on this planet, then we need to get past these "ick factors" and "taboos" imposed on us.

I saw online that some businesses sell homemade family cloths, but they're expensive. I settled on some cheap, widely available washrags. You don't want the washrags to be too thick, and if you want to go greener, you can go with organic washrags. I suggest using dark-colored rags for aesthetic reasons.

I still buy toilet paper for other members of my family, and I still use it for "number two," but some families use cloths for all "numbers," and that's cool, too. One roll of recycled toilet paper now lasts us more than a month.

I keep a basket of clean washrags on the back of the toilet and a half-full bucket of water with a lid (super-important) next to the toilet. I toss the used rags into the bucket. I also use this bucket for my reusable menstrual pads. I put baking soda, tea tree oil or laundry detergent in the bucket to help keep things clean and to eliminate any possible odors until I'm able to wash them.

Candice Brasington
Conway, South Carolina

*Bundles of homemade family cloth wipes are available through Etsy (*www.Etsy.com*). A bundle of 25 reusable wipes typically sells for about $24. —*MOTHER

We Pay for Top Tips

Do you have handy home, farm or garden advice? We pay $25 to $100 for each tip we publish, plus $25 for each photo or video we use. Send your tips to Letters@MotherEarthNews.com.

What to Feed Wild Birds

I want to feed the birds that visit my backyard, but I'm not sure what types of seed to set out. What do birds like best?

Different birds are attracted by different kinds of seed, so offering a variety will beckon a diverse mix of feathered friends. Just make sure the birdseed or food you choose is compatible with both the bird feeder and the birds you hope to attract.

Sunflower seeds. Many small birds prefer black oilseed, especially in northern latitudes. Large-beaked birds will eat striped sunflower seeds. Hulled sunflower seeds will appeal to the greatest variety: They will attract jays, red-bellied woodpeckers, finches, goldfinches, Northern cardinals, evening grosbeaks, pine grosbeaks, chickadees, titmice, nuthatches and grackles.

Bring a bevy of birds to your backyard by knowing which seeds will satisfy.

Millet. Most small-beaked ground-feeding birds love white and red millet. Both will attract quail, doves, juncos, sparrows, towhees, cowbirds and red-winged blackbirds.

Cracked corn. Medium cracked corn is about as popular with ground-feeding birds as millet, but it's vulnerable to rot because each kernel's interior easily soaks up moisture. Leave small amounts mixed with millet on feeding tables or in watertight hopper feeders. Avoid fine cracked corn because it quickly turns to mush, and coarse cracked corn because it's too large for small-beaked birds. Medium cracked corn will attract pheasants, quail, doves, crows, jays, sparrows, juncos and towhees.

Milo, wheat and oats. Low-priced birdseed blends typically include a mixture of these agricultural grains. Most birds discard them in favor of other food, however, which then leaves the grains to accumulate under feeders and attract rodents. Ground-feeding birds in the Southwest will eat milo, as will pheasants, quail and doves.

Thistle (nyjer). A preferred food of American goldfinches, lesser goldfinches, house finches and common redpolls, nyjer is sometimes called "black gold" because, at about $1.50 per pound, it's more expensive than other birdseeds.

Suet. Otherwise known as beef fat, suet will attract insect-eating birds, such as woodpeckers, wrens, chickadees, nuthatches and titmice. Place the suet in special feeders or net onion bags at least 5 feet above the ground to keep it out of the reach of dogs. Suet is particularly helpful during cold weather and migration, when birds need extra fat reserves, but you can also purchase "no-melt" suet cakes for use in warmer weather. To learn how to make your own, read "How to Make Cakes for a Suet Bird Feeder" at *http://goo.gl/DZ2GQQ*.

Peanuts. Placed in tube-shaped, metal-mesh feeders, peanuts will entice woodpeckers, jays, chickadees, titmice, bushtits, nuthatches, brown creepers, wrens, kinglets, Northern mockingbirds, brown thrashers, starlings, and yellow-rumped and pine warblers.

Homemade Alternatives

Peanut butter pudding. Peanut butter is a good substitute for suet. Mix 1 part peanut butter with 5 parts cornmeal, and stuff the mixture into holes drilled into a hanging log or into the crevices of a pine cone. It will attract woodpeckers, chickadees, titmice and occasionally warblers.

Fruit for berry-eating birds. Fruit specialists, such as robins, waxwings, bluebirds and mockingbirds, rarely eat birdseed. To attract them, soak raisins and currants in water overnight, drain, and then place on a table feeder. You can also purchase birdseed blends with a dried fruit mixture. To attract orioles and tanagers, skewer halved oranges onto a spike near other bird feeders, or provide nectar feeders.

Nectar for hummingbirds. Make an artificial nectar of 1 part sugar to 4 parts water. Boil briefly to sterilize and dissolve sugar crystals. You must keep the feeders scrupulously clean to prevent mold growth.

—National Audubon Society

Is Rubber Mulch Safe?

Are mulches made from ground-up tires safe to put on my garden beds?

Rubber mulches made from shredded tires are touted by manufacturers as permanent, aesthetically pleasing, and safe for flowers, plants and pets. Companies assert that the mulch material is an environmentally friendly solution to a major waste-disposal problem. But scientific literature makes abundantly clear that rubber should not be used as a landscape amendment or mulch. There is no question that toxic substances leach from rubber as it degrades, contaminating soil, plants and waterways.

The toxicity of rubber leachate is mainly a result of its mineral content: Aluminum, cadmium, chromium, copper, iron, magnesium, manganese, molybdenum, selenium, sulfur and zinc have all been identified in laboratory and field leachates. Of those minerals, rubber contains very high levels of zinc—as much as 2 percent of the tire mass. If rubber products have been exposed to contaminants, such as lead or other heavy metals, during their useful lifetime, they will absorb those

BRUCE MCGLENN

metals and release them as well. A number of plant species have been shown to accumulate abnormally high levels of zinc, sometimes to the point of death. U.S. Department of Agriculture researcher Rufus Chaney, who has studied zinc and other metals in soils and plant materials for decades, strongly believes that ground rubber should not be used in any compost, potting medium, or agricultural or garden soils because of zinc toxicity. Acidic soils and aquatic systems are particularly sensitive because heavy metals are less tightly bound to the soil and thus more available for plants and animals to uptake.

Rubber mulches can also leach various plasticizers and accelerators that are used during tire manufacturing. In high enough concentrations, some of these rubber leachates are known to be harmful to human health; effects of exposure range from skin and eye irritation to major organ damage and even death. Long-term exposure can lead to neurological damage, cancers and mutations.

Some of the toxic materials in rubber break down quickly, while others bioaccumulate. One common rubber leachate is 2-mercaptobenzothiazole, a chemical commonly used as an accelerator during the production process. In addition to its known human health effects, it is highly persistent in the environment and acutely toxic to aquatic organisms—its environmental persistence may cause long-term damage to aquatic environments constantly exposed to rubber leachates.

Another family of organic leachates under scrutiny are the polyaromatic hydrocarbons (PAHs). These compounds, used as rubber softeners and fillers, have been repeatedly

4 Herbs to Help You Fall Asleep

I sometimes have trouble sleeping. What herbs would you recommend?

If you struggle with insomnia or just have occasional trouble drifting off, consider trying one of the following herbal sleep aids. (You can also find potent tinctures made from these herbs, and follow the manufacturer's recommendations for consumption.) Some natural sedatives may work better for you than others, so be patient if you don't feel the effects of the first one you try.

Chamomile. A cup of chamomile tea before bed will help you unwind and fall asleep faster. Steep a heaping tablespoon of the dried flowers in boiling water.

Hops. Although this natural sleep aid is a component of beer, tossing back a glass of beer before bed won't have the same effect as drinking a tea made from 1 to 2 teaspoons of hops flowers (known as "strobiles"), which will often ease you into a deep, restful sleep. The scent is soothing, too. Hops work well on their own, but paired with chamomile and lavender, they make a particularly slumber-inducing herbal sachet to tuck into your pillow.

Ease into sleep with a cup of chamomile tea before bedtime.

Valerian. This plant is a well-researched sedative. In a Swedish study of valerian's tranquilizing effects on those with insomnia, almost 90 percent of participants said this herb helped them fall asleep. Use 1 to 2 teaspoons of dried valerian root to make a tea.

California poppy. Preliminary studies confirm that the California poppy has mild sedative and anti-anxiety effects, making it a good slumber-inducer. Although it is a relative of the opium poppy, the California poppy doesn't contain opiates, so using it won't cause dependence problems. Steep 1 to 2 teaspoons of dried aerial parts of the plant in boiling water to make a relaxing tea.

—Susan Melgren

DREAMSTIME/PATHASTINGS

demonstrated to poison aquatic life. After two years in a laboratory test, PAH leachates were shown to be even more toxic than at the study's inception.

According to the Environmental Protection Agency, we generate 290 million scrap tires annually, and scrap tire stockpiles pose significant fire hazards. Obviously, we need to find a safe way to recycle these slow-to-decompose materials, but grinding them into mulch to spread over our gardens and playgrounds is not a wise choice. A better alternative is to increase the use of shredded tire rubber in asphalt for roadways.

—Linda Chalker-Scott

How Antioxidants Work in Your Body

I often hear that I need to eat antioxidant-rich foods. What are antioxidants, and how do they work?

Antioxidant molecules in our bodies inhibit the oxidation of other molecules and neutralize "free radicals," or unstable compounds. Free radicals are created by oxidation, a chemical reaction involving the loss of electrons in a molecule. More familiar examples of oxidation are butter going rancid, iron rusting, apple slices browning and fires burning. Apply antioxidant-rich lemon juice to your sliced apple, and what happens? The flesh will resist browning.

Free radicals accelerate aging and contribute to many chronic illnesses, including


Eat your colors! Vividly hued foods, such as these bright berries, are rich in antioxidants.

Alzheimer's disease, arthritis, atherosclerosis, cancer, cardiovascular disease, cataracts and diabetes. To stabilize themselves, free radicals snatch electrons from other atoms or molecules, which can then spark a chain reaction of electron raiding.

While the body's free-radical production is normal and sometimes even useful, an overload of oxidation can damage molecules, such as DNA, fats and proteins, thereby disrupting cell functions. In addition, oxidation stirs up inflammation, which generates more free radicals.

Other conditions heighten free-radical formation and oxidative stress: tobacco smoke, certain forms of pollution, fever, infection, chronic inflammation, chronically elevated blood glucose (diabetes), ultraviolet light and radiation, extreme exercise, and consumption of unhealthy hydrogenated fats, such as trans fats and oils in fried foods.

Many normal bodily processes create free radicals, such as when our bodies break down nutrients for energy, fight off infection or detoxify drugs. But the body also produces its own antioxidants to neutralize free radicals—a process that works well until an excess of free radicals overwhelms the system.

Eating antioxidant-rich foods can restore the balance. Animal products contain some antioxidants, but your richest sources are plants, which contain antioxidants such as vitamin C, vitamin E, selenium, carotenoids and flavonoids.

Carotenoids and flavonoids double as plant pigments, so eat a variety of colorful fruits and vegetables, as well as culinary herbs and spices, to maximize your dietary antioxidants. Particularly rich sources include berries, cherries, red grapes, papaya, pumpkin, carrots, green tea, garlic and cruciferous vegetables, such as broccoli, cabbage and kale.

—Linda B. White, M.D.

Stumped about something in your home or on your homestead? Email your questions to AskOurExperts@MotherEarthNews.com, or write to Ask Our Experts; Mother Earth News; 1503 SW 42nd St.; Topeka, KS 66609. We'll answer as many as we can here.

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(CONTINUED FROM PAGE 10)

each magazine for future reference, and I share numerous articles with family and friends. I'm going to have to get a replacement for my August/September 2014 issue, though, as I gave away so many articles!

I want to mention to you the difference between "peddle" and "pedal" in reference to the Country Lore piece by Monty Kaasch on Page 76 (August/September 2014). "To peddle" means to sell things from a variable location, such as selling door to door or on the street. "To pedal" means to rotate the pedals of a machine, such as a bicycle.

Nadia Smith
Pocatello, Idaho

Thank you, Nadia! Yes, we are embarrassed we let that error slip through. —Mother

Toads vs. Slugs

In response to the article "Gardeners' Glossary of Pest Control Solutions" in the June/July 2014 issue: I control deer by draping netting over fruit trees as a row cover. The deer haven't returned since I put it on. I lay stakes and long poles on the netting's edges to hold it down to fully protect the crop. This tactic would probably work for rabbits, too.

I didn't see toads mentioned as a means of controlling slugs. I have a couple of small goldfish ponds that keep the toad and tree frog populations thriving in my garden. Thanks to these natural predators, I just handpick any pests I spot, and then I let the toads do the rest. I haven't seen a slug in my garden in years. Is there a downside to toads that led you to exclude them?

Jay Smith
Oxford, North Carolina

Nope! As far as we know, pest-eating toads are terrific. —Mother

Grief Avoided

This is a long overdue letter to say thank you. I was a single mother of three small children in the '70s, and I put them to work helping me start a garden. We were able to get a substantial amount of our food from it. I began to shop at a "hippie" health food store. As with many things these days, even that was better "back then." We'd bring our own containers and buy items such as honey and shampoo at bulk prices. One day, I spotted my first issue of Mother Earth News while shopping there, and boy, was I ever hooked. It inspired me to get even more involved in the "back to the land" lifestyle I was already so enjoying.

Fast-forward a little to a remarriage, and Mother Earth News inspired my family to pack a U-Haul and move halfway across the country. No jobs, no home—but we did take the rototiller.

We thought we'd found the perfect piece of land, but an article I'd read in Mother sure saved us from making a huge mistake. The realtor never told us it was a landlocked piece of property. Your article said to make sure buyers have access to their new land, so I asked about it. The realtor gulped, and I insisted he answer our question before we bought. It turns out, none of the neighbors wanted us there because we were "strangers." None of them would provide a right of way so we could actually get to the land. There was no sale, and thus we didn't tie up our money in a useless piece of property.

I've always wanted to write to you to let you know how much grief that advice saved my family. Thank you for that, and for all the other helpful information since then.

We did eventually find a good spot, and this past summer marked the 35th year that a garden has helped fill the canning jars lining our pantry shelves. And those kids who had to pull all of those weeds back then? All three have gardens of their own now, and the grandkids love to eat fresh peas straight off the vine.

Judy Way
Phillips, Wisconsin

'Neo-Marxist Drivel'

I foolishly paid in advance for a two-year subscription to what I thought was a DIY and homesteading magazine. What a waste of time and money. Little did I realize I had forked over so much money to support neo-Marxist drivel.

At first I thought I could just ignore the nonsense and concentrate on the farming and self-reliance articles, but over time, it became

FOTOLIA/VIDADY

ridiculous. Articles about not having children, the evils of *insert-any-facet-of-modern-life-here*, "green" cars, and capitalism in general all got to be way too much to stomach.

Donald Ramakers
Tustin, California

We will provide a refund on all undelivered issues to any subscribers who are unhappy with the magazine and decide to cancel their subscriptions. —Mother

Bovine Bliss

Wow! What a fabulous article on industrial agriculture in your June/July 2014 issue ("Hidden Downsides of the Green Revolution"). This is such a complex subject, and it should be a huge concern to us all.

We raise cattle on large pastures with bush areas, and they graze so contentedly and look so healthy that we just know it's all how it should be. My philosophy is that if agriculture doesn't look beautiful, you're doing something wrong.

Deborah Butler
Rose Prairie, British Columbia

A Childfree Life

Thank you for publishing the article "Making a Green Choice: Childfree Living" by Lisa Hymas in your February/March 2014 issue. I'm not at all surprised by the heated and polarized debate the article has triggered.

COMING UP NEXT

DECEMBER 2014/JANUARY 2015

Homemade One-Pot Meals

Find Quality Seeds: Pros and Cons of Heirlooms vs. Hybrids

Grow Your Earliest Tomatoes Ever

Protect Your Animals With Livestock Guardians

Make Your Own Deodorant, Shampoo and Toothpaste

How Industrial Meat Is Killing Small Towns

How to Make Hay by Hand

Electric Cars Update and FAQ

I'm a childfree woman in my 30s. When asked why I don't have children, I simply state, "I just never wanted any," but it almost seems taboo to admit this. Parents tend to respond with comments to the effect of, "You'll change your mind," or, "It's different when they're your own," implying that my choice is somehow immature or shortsighted. Should I really have a child without feeling a desire for one, only in the hope that after the child is born, I'll actually be glad I did it?

I don't dislike children—I've just never had a desire to raise my own, and I also share Hymas' concerns about the planet's overpopulation. Thank you for opening this issue up for discussion by publishing the article.

Melanie Alvarado
Trinity, Texas

Solace in the Small Steps

Because "Making a Green Choice: Childfree Living" (February/March 2014) is still drawing comments, I'd like to add mine, as it hasn't been mentioned yet. Shall we blame our problems of resource depletion on overpopulation, or instead on overconsumption, unsustainable living, and a selfishness that prevents us from seeing our responsibility to others around us and to those who will follow us? To the readers of this magazine, I am probably preaching to the choir, but it would take four Earths to support the planet's current population if each person had the habits of the average U.S. citizen.

This is something that deeply concerns me, as I have four grandchildren and I wonder what their world will be like. For that reason, I found a great deal of peace in the article "Small Steps Can Change Our World" in the June/July 2014 issue. I'm going to try to be content to make a difference within my sphere of influence, and try to worry less.

Mary Meyers
Mokena, Illinois

Choosing for Ourselves

In response to "Small Steps Can Change Our World" (June/July 2014): Congratulations to Jack's parents for allowing their son the freedom to research and determine whether lollipops were good to include in his personal diet. So what is admirable, then, about imposing what he decided upon the other parents and students in Jack's classroom? While the tone of the rest of the article advocates

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IFC = Inside Front Cover, IBC = Inside Back Cover, OBC = Outside Back Cover

making personal choices that improve our world—which is a highly desirable method of modeling change to our fellow citizens of Earth—forcing similar change on others is dictatorial and arrogant.

I sure hope little Jack understands that, in an ideal democratic society, we all get to choose for ourselves and bear the consequences of our choices. Far better that Jack and his parents would have presented the evidence to Jack's peers (and their parents) and let them arrive at their own decisions.

Susan Winter
Puyallup, Washington

Do What You Can

I was motivated to write to my local library, bank and even pediatrician's office after reading Joel Salatin's "Small Steps Can Change Our World" in the June/July 2014 issue. What a great article! I have a young son with whom I stay home, and we go to the library about once a week for story time. The library serves a snack, and it's always some kind of processed cookie, cracker or chips, along with a sugary, colored, flavored drink.

Up until reading the article, I'd just quietly and politely opted out of the snack. Inspired, however, I decided to write a letter to the library about my thoughts on its choice of snacks. This is just a tiny step. It might not make a large change, but all steps have some ripples, no matter how small.

Joel Salatin is right: Do what you can, when you can. Set your example, and with enough of us joining in, things can't help but change. I also wrote to the bank and the pediatrician's office about their long tradition of handing out lollipops to children. I guess, to most people, it doesn't seem strange for even the doctor's office to give out lollipops to children. The thing that *was* strange was the look my husband and I got from the nurses when we said that our 2-year-old son didn't know what a lollipop was yet and that we weren't in any hurry to teach him. Small steps, but steps nonetheless! Thank you for the article.

Justine Riley
Mayfield, Kentucky

Raccoon Concerns

I want to pass along a report from the *Seattle Post-Intelligencer* about raccoons being a host for the roundworm parasite known as *Baylisascaris procyonis*:

"This roundworm can cause extremely serious disease conditions in humans. Indeed, for vulnerable groups such as children and the elderly, as well as those with compromised immune systems, exposure to this roundworm can be fatal. Most exposure occurs when humans have direct or indirect contact with raccoon droppings, which can contain millions of roundworm eggs. Although the roundworms themselves can survive only inside an animal host, their eggs are extremely tough and can remain viable for years in soil, sand or even water. Thus, people can come into contact with old and decomposed raccoon droppings without realizing it."

A friend of mine traps raccoons and carts them away to try to prevent any exposure.

Jeffrey Dickemann
Richmond, California

*According to the Centers for Disease Control and Prevention, human infections of this parasite are rare, but contact with raccoon feces should be avoided. Raccoons defecate in communal sites called "latrines." Their feces are usually dark and tubular and have a pungent odor. If raccoons have established a latrine near your home, you may want to remove it. Search for "raccoon latrines" online, and you'll find several websites that describe how to do this safely.—*MOTHER

Pickle Perfect

I tried the recipe for Simple Thai Refrigerator Pickles in the August/September 2014 issue ("How to Make Pickles"), and I loved them! I grow lots of different vegetables here in the Alentejo region of Portugal, and I'm always on the lookout for new ways of preserving to continue the season. These pickles are a tasty, easy-to-make dish I like to serve with lunch.

Jeanette Elliott
Alentejo, Portugal

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JOHN ELLIS WATER DISCOVERY

VIDEO PROOF

Norman Rockwell
and Other American Icons

These are people that influenced my life in New Rochelle, NY where Norman Rockwell lived for 25 years and where my family lived for 3 generations.

We all knew and loved the man in spite of a book trashing him in another attempt to destroy everything that is great about America! I am writing a book with a rebuttal that includes the untold stories about many others that shaped our country.

Did you ever wonder what happened to over 100 signed letters from FDR, that Harvard wanted for their archives?

Most of these people I met in my parents living room: Dr. Norman Vincent Peale, James Cash Penney, Lowell Thomas, Charles E. Wilson (Chairman of GE, FDR appointed him head of the War Production Board WW2), Carrie Chapman Catt (Woman Suffragist), Dr. James E. West (Chief Scout Executive, Boy Scouts of America), William Frank Snyder (FDR's lawyer and close friend, who also had polio, wrote his will and handled his financial affairs including Mrs. Delano, complaining to my mother: "The Roosevelt's are using my pool!"). "Buffalo Bob" Smith (It's Howdy Doody Time!). C.L. Lowes: (My grandfather started BOND BREAD. Buying trainloads of flour for 50 plants, he waited for the price of flour to go UP so farmers could make a fair profit...he was unique! General Baking Co became General Host..."Twinkies") Richard Ellis (my brother, commercial Real Estate) and many others!

After my father died, Dr. Peale said the eulogy and inspired me to increase water properties back to what it was before "The Flood" (living to Biblical ages). After "The Flood" they didn't live as long!

Since I am the first person in history to do it, should be ample proof that it had to come from divine inspiration! With an Engineering Degree that includes Steam Plant Design, I increased the Hydrogen Bond Angle (HBA) in ordinary water from 104 to 114 degrees, confirmed by scientists at Los Alamos Nuclear Lab and Lawrence Livermore to The Washington Times.

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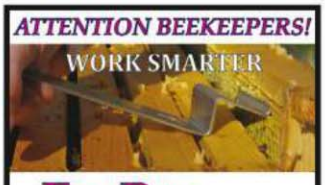

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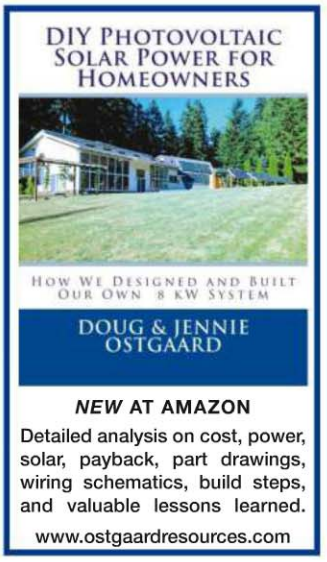

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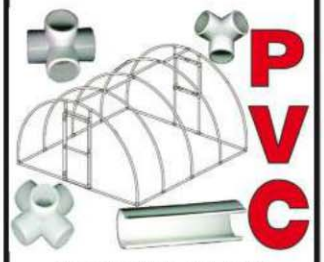

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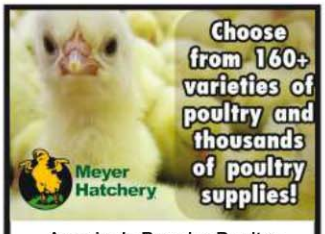

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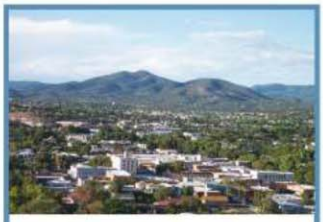

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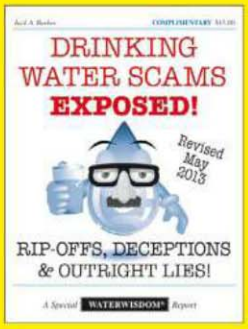

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