

# Permaculture *Activist*

## Hidden Connections in the Garden



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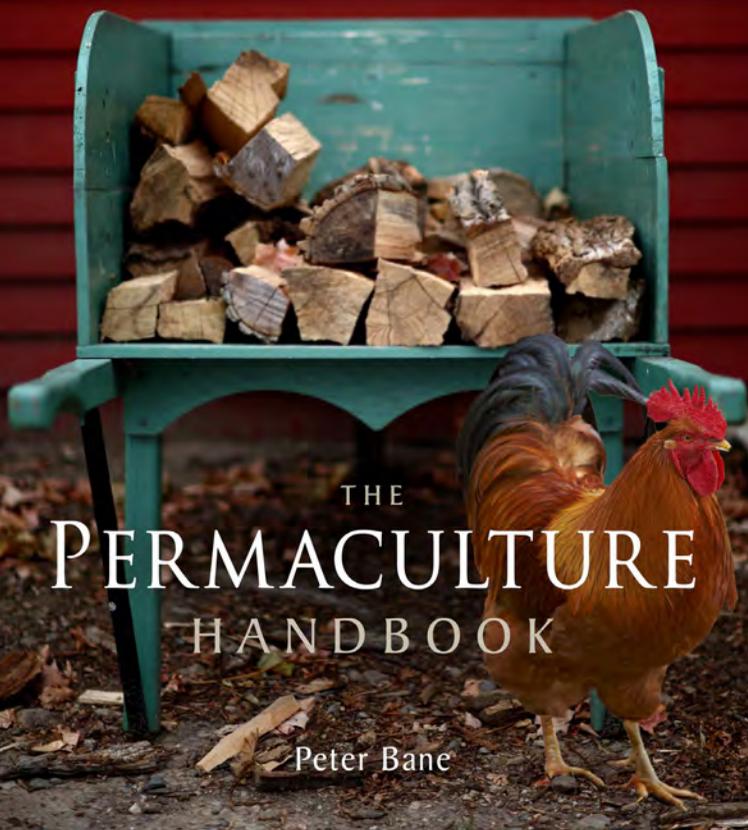
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Permaculture Activist welcomes your articles, news items, photos, and other materials of interest. Please contact the Editor in advance of your submission to request writers guidelines and present your ideas. (editor@permacultureactivist.net)

### Upcoming Issues, Themes & Deadlines

<b>#82</b>	<b>Raising Staple Foods</b>	<b>September 1</b>
<b>#83</b>	<b>The Economy of Wood</b>	<b>December 1</b>
<b>#84</b>	<b>Home &amp; Hearth</b>	<b>March 1, 2012</b>

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# Editor's Edge

## Connecting the Wrong Dots

Scott Horton

SOMETIMES WE CAN BE SO INTENT to design connections and make sure that energy cycles are complete, functions are maximized and elegantly stacked, etc., we forget that some connections will make themselves. Letting connections form naturally can be a valuable, even necessary design tactic. As we connect the dots and our vision takes on the clothing of the real world, the picture that emerges is often not the one we foresaw. When that happens, we need to take stock of the real image and gauge how it relates to the dream.

I have an acquaintance in a small town in Southern California whose dream is to create a community garden that would galvanize the town in support of green best practices, create a cohesive and healthy social core, and propagate awareness and action. Her vision included marketing surplus produce through her store in the village and interfacing with schools, social organizations, and other businesses. This would give the garden project a multi-level appeal and several bases of support. It was, and is, a great idea, but in six years of conversations, meetings, and planning, the community garden has not gotten on the ground.

Despite every good intention, my friend's dream has failed to take root in a community that appears to be ripe for it. There is a growing green front in the town and in the surrounding area that supports a steadily increasing number of environmentally conscious businesses. The market has shown a commitment to locally sourced produce and other goods and services. What went wrong?

The dream of a community garden has languished under the burden of over-design on the front end. My friend has so completely designed the vision that there is little room for meaningful input or participation by other villagers. She has very specific ideas about the location of the garden, who should own the land (the vision is for sole proprietary ownership and an implied benevolent access for tenant gardeners), gardening practices (a strong but experience-free insistence that all plots be managed biodynamically), and other non-negotiable "requirements" without which she refuses to play. Her expectation is that participants (not partners) will invest their time and money to develop the garden, local businesses will donate materials, and the results will benefit everyone. The garden is envisioned as a community asset, but my friend wants to call most of the shots.

Is it any wonder that the interest of community members who become involved soon flags, or that energy is wasted and no garden has appeared? Periodically, my friend revives the vision. This is usually coincident with the arrival of a new crop of community members or the emergence of newly converted or re-energized eco-folks, but the pattern is apparent and, sadly for all, leads to a dead end.

As designers, we learn to observe nature over time, to make

informed decisions, solve problems, and reconnect ecosystems so they become productive and regenerative. But we also need to observe ourselves and our designs as they evolve, in order to make course corrections in response to the dynamic aspects of nature and society. Failure is guaranteed on at least some level if we make a design and then doggedly stick to a prescribed outcome; better to adopt an observe-and-tweak-as-you-go approach. This is especially true of human connections and systems in permaculture. In every failed permaculture project I know of, either the lack of community engagement or poor social relations have been cited as a significant contributing factor.

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### Failure is guaranteed on at least some level if we plan a design and then doggedly stick to a prescribed outcome.

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So let's connect the dots as we design, but remember to make room for the *wabi sabi* of some connections—especially the human ones—that want to make themselves, and let pedantic rigidity take a break. Our designs will be the better for it. Δ

*Scott Horton is Editor of Permaculture Activist and lives in the San Francisco Bay Area.*

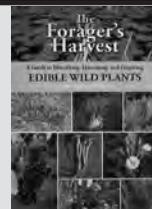
### Publisher's Note

Veteran guest editor John Wages, now based in northern California, is stepping into a larger role with Permaculture Activist. He will edit the next issue, #82: Growing Staple Crops, for November, and will begin alternating editorial duties with senior editor Scott Horton through next year. You can contact our editorial team by writing editor@permacultureactivist.net.

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## Green Acres Neighborhood Vision

(adapted from the plan adopted by the City of Bloomington)

### • Become an exemplary community for green living and sustainability.

1. Organize on-going sustainability initiatives and educational outreach.
2. Protect and enhance the unique green image of the neighborhood by establishing partnerships with public, private, and non-profit institutions.
3. Improve stormwater drainage to better use and care for water resources.

### • Strive for a stronger and more vibrant neighborhood by increasing social capital.

4. Attract both families and new homeowners to the neighborhood.
5. Strengthen the overall block captain program and bring every block in the neighborhood into communication through this program.
6. Have regular and frequent neighborhood celebrations and events.
7. Increase attendance and participation at GANA meetings and activities.
8. Conduct several clean-up and trash removal events to redistribute items.

### • Achieve excellent connectivity within the neighborhood, and with the greater Bloomington community and government.

9. Establish working partnerships with Indiana University.
10. Work with local and state government agencies to mitigate traffic impacts and identify opportunities to improve bicycle and pedestrian safety throughout the neighborhood and surrounding areas.
11. Improve relationships between the neighborhood and city government.
12. Ensure that infill development within the neighborhood is context sensitive.

need to do is help them harness it!”

That was the beginning. Aha, yes! And Green Acres borders the part of campus that contains SPEA, the School of Public and Environmental Affairs. Turn Green Acres into a laboratory for sustainability through partnering with SPEA classes! Encourage SPEA graduate students to live in Green Acres!

On the wings of these thoughts, we went through the eye of the needle, producing a visionary document that, in our vivid imagination, turned Green Acres from a sterile post-WWII housing tract into our ideal, bucolic, abundant, fun, friendly, warm version of a village.

I thought our design was way too utopian for the neighbors to absorb without a lot of preparation. Sylvia thought we should present it at the next GANA meeting.

Her enthusiasm was infectious. They not only listened, they got excited. The clincher came when an IU professor from Turkey (who, by the way, has since moved) pored over our notes and drawings, then looked up, and said, smiling, that our design for the neighborhood reminded him of his village back home. Bingo! He recognized the atmosphere of renewed intimacy: adjacent back yards turned into commons with paths winding through, cars clustered at the edges of the neighborhood, intersections transformed into painted pedestrian plazas, little home-based businesses and gardens everywhere, work parties, shared tools, skills, resources...

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**I thought our design was way too utopian for the neighbors to absorb without a lot of preparation. Sylvia thought we should present it at the next meeting.**

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The enthusiasm of that meeting helped Green Acres win a city-wide contest to create a ten-year plan with the help of the city planning department. This was the very first plan in the city to be based on the principles of sustainability. After six months of meetings, our inspired Pc design was rendered in bureaucratese. ([bloomington.in.gov/media/media/application/pdf/52.pdf](http://bloomington.in.gov/media/media/application/pdf/52.pdf))

### ***City village in search of a home***

Soon after, a house came up for sale. Small, cheap, funky. Could we buy it as a common house for the neighborhood? We invited officials from a number of city departments to check it out, offer their opinion. Their unanimous advice? NO. Despite the fierce desire of a few of us to get this house, we needed to get more programs in place and more people involved before we could even think about finding 50 households, each of which

would contribute \$30/month to pay for the house. Of course, they were right.

Back to square one. Meanwhile, citywide, the buzz on Green Acres was that we were going great guns into sustainability. But we knew that was a joke. It was all in our heads! We had nothing on the ground, except lovely little “Green Acres” labels atop the street signs on each corner. (Four years later, as foreseen by one neighbor, an IU professor, most of our sweet signs have apparently been stolen as souvenirs by departing students. At the time I thought him too cynical.)



*Preparing to plant the fall garden in August 2010. Workshop participants took time to learn the hows and whys, as well as to apply what they learned to their own gardens.*

Meanwhile, GANA had held a number of events—a speaker series, annual trash pick-up and plant-share days, a Solstice feast, ceremony, and parade. These events were successful. People would get active in the neighborhood association, and then they’d leave town! Even homeowners who were not students left town. I thought for sure we could count on them to build our core team. And each time an activist moved out, I descended into despair. It felt like the bottom was continually sliding out from under all our efforts.

It was just after we agreed to give up on the first little house that the house next to me on DeKist Street came up for sale, again. And that’s when I decided to buy it myself and to do what Nathan had suggested—turn the large, sunny lawn into a neighborhood garden. That way we would get our common house and our garden in one fell swoop.

One year after our official plan had gone into effect, when the city asked us how we were doing, we could say, truthfully, surprising even ourselves, that our Green Acres Neighborhood Garden (GANG) had begun to satisfy most of the stated objectives. [See sidebar this page.]

### ***The garden gets growing***

Now, back to the beginning. As I said, I was standing there, looking out the window in December 2008 and realized I had no idea what I was doing—either about gardening or about how to transform this boring lawn into a lively neighborhood commons.

The PDC had revolutionized both my perception and my philosophy; what it did not give was on-the-ground training in how to grow plants.

So I turned to Keith Johnson, Peter’s partner, plant maven, and my other PDC teacher, for suggestions. I told him that the one design element I absolutely had to have was a pond, at the top of the garden. Done! Immediately, he suggested that we hold a series of workshops in the garden (and in my house). In one (two-day) workshop, we’d design and build the pond. Instead of lining it with imported stones, we’d recycle that horrible old basketball court from my back yard, breaking it up with a sledgehammer into chunks of “urbanite.”

The other workshops would take participants through the entire growing cycle, from planting through harvest, to food preservation, and putting the garden to bed. Aha! In one stroke this idea provided a way for me and others to learn permaculture “on the ground,” get the garden going, provide food for lots of people, connect the garden to the neighborhood and the wider community, and provide structure and process to hold it all together.

And it worked. In spades.

The press was also interested. We are now in our third growing season, and the local paper has written a number of articles about various aspects of the GANG garden. The local food co-op promotes our workshops in their monthly newsletter. Garden groups around the city

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**[Workshops] provided a way for me and others to learn permaculture “on the ground,” get the garden going, provide food for lots of people, connect the garden to the neighborhood and the wider community...**

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and individuals from as far away as Pennsylvania and Louisville have come to tour the garden and find out how it works. Lasagna gardening is catching on. Other neighborhoods ask me to give presentations on the garden and are inspired to emulate its various features. We are partnering with a SPEA undergraduate class to design and implement projects for the garden. First, a compost system; next, a cob oven; for the 2011 fall semester, the class will focus on either a vertical garden wall or a greenhouse.

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And how does it work? Well, except for the workshops, it's still pretty much ad hoc, with me, and whoever else is around, responding to problems as they emerge. I do keep a detailed blog of comings and goings in the garden, including all the workshops. (The 2009 and 2010 workshop series are archived at [www.tendrepress/category/blogs](http://www.tendrepress/category/blogs); the 2011 season starts afresh at [www.ganggarden.wordpress.com](http://www.ganggarden.wordpress.com).)

This is the third year that we've held between six and eight workshops in the garden, all by donation only, with the educational programs now under a non-profit, the Association for Regenerative Culture. ([www.arculture.org](http://www.arculture.org))

After the first year, I decided to provide opportunities for new permaculture teachers; this year five fledgling teachers will guide various workshops in the garden.

I'm still learning how to garden myself, though I now feel a bit more comfortable "on the ground." I recognize many vegetables in various stages of their life cycles. I usually know which plants are "weeds" and which weeds are good to eat; which plants need acidic soil and which not; which ones like to grow together. I even know how to cut out a squash borer without killing the vine. And I love putting all my office pack, leaves, garbage, rabbit poop, my own urine, and newspapers to work in the garden beds.

Nearly two years ago, one of my two sons decided to relocate here, from Massachusetts. I like to think that the garden was one of the draws. He moved into the DeKist house on the garden property and, besides starting his own food sustainability business (

*The GANG garden from the top as a crew finishes the cob oven on a cold November day. The oven became a catalyst for neighborhood change.*

---

**The street is more interesting when there's a garden visible from it. There's more to see, and there's activity of all kinds. This makes passers-by slow down.**

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dentower.com), has become my right-hand man. Colin is one of our garden regulars.

While my son and I have benefitted greatly from his move here, and we've followed through with the plan to build partnerships with the University despite the loss of core team members, the original theme of "moving," which has so influenced both Green Acres and GANG, continues to be a challenging subject for contemplation. In fact, the transitory nature of living in the Green Acres Neighborhood has, at this point, completely transformed my way of thinking about the garden.

Once again, I had to go through the eye of a needle. And indeed, I have to confess, the winter of 2009-2010, when Kevin left town, was my nadir. Kevin was fully committed to the project. After renting in the neighborhood, he and his wife Kimberly bought a house here. He participated in all the workshops. He wrote the grant to the city that got us all of our tools. He was present week after week with the few others who would commit to regular garden care and weeding. He was the one I turned to when I had to think through some problem. So, when they decided to move to Ohio, I was devastated and couldn't speak to him for months.

But then, something wonderful happened. I actually listened to my inner voice. And it told me, in soft, dulcet tones, to rest, and wait, that the spring would bring new energies to the garden gate. That I need not worry; winter was always followed by renewal.

And my god and goddess, it was true!

### ***If you build it they will come***

Last June, I met Mary, a new neighbor and master organic gardener, at the neighborhood plant-share. She has been a GANG regular ever since. And Mark, who drives across town to work in the garden. And Al, who interned with the garden for a year after taking the SPEA course. And best of all, last summer, two young children who worked with me every day after school for weeks until their family moved away. And Jonathan, a neighbor whom I had never met, emailed me one day to say that he wanted "to be in charge of the watering team." Three times a week, in the early

morning during a very dry summer, I could hear that hose going outside. Then Jonathan finished his PhD and moved away. But one of his team emailed me last week to say she'd like to help again this year. So it goes, endless, circulatory renewal.

Gradually, over the past year, by contemplating impermanence, I've reached a new understanding, one which, again, transforms everything. Permaculture teaches how to use the "flows" of light, air, water, and other energies in the garden. I had to realize that the people who move through it are another kind of flow, that I must learn to "catch and (briefly) hold" this rich flow of people. In a university town, this garden can train and familiarize people with the philosophy and practice of permaculture, both in the garden and in its relation to the neighborhood and community around it. Those who move through the garden are as spores on the wind; like Kevin, they will fan out into other cities and towns, putting permaculture into practice in their own ways.

Last July, when the two wonderful children told me they'd be moving, I was sad, but I was not devastated. That's when I knew that my long contemplation had transformed me.

Until this year, students living in the neighborhood have not shown any abiding interest in the garden, but now I notice that they walk by much more often where they used to drive. Simply put, the street is more interesting when there's a garden visible from it. There's more to see. This makes passers-by slow down; there are even opportunities to say hello. I've been known to hand a cucumber through the fence.

This year, there's a new development. A few undergraduates are showing up! Ash lives across the street; he comes over whenever he sees us working in the garden. Taylor lives a few streets away, but Mary has recruited him. Katie, also on DeKist, showed up at one of the workshops and wants to be a regular now. Stephanie has stayed on from the last SPEA class. She brought us some more tomato plants just the other day, and taught a children's workshop on "Inviting the Little People In" (think fairies and elves) on the afternoon before our Summer Solstice Cob Oven Pizza party June 25th.

Gradually, more and more connections form: within myself, in the garden, in the neighborhood, and in the community at large. Gradually, I learn the fine art of detachment, remaining centered but engaged amidst the whirlwind of constant change.

Two interesting challenges present themselves at this point. One is ongoing,



*Students from the School of Public and Environmental Affairs (SPEA) learn how to build with cob during this simple but profound demonstration project.*

and vital, though it seems abstract; the other is new, up close, and personal.

The first has to do with the type of commons that this garden presents: a public-private partnership of a certain kind, where an individual owns the land but gives the use of it to the larger

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community. I would like to see the City of Bloomington provide liability insurance for this kind of project. Given the conditioning we've been subjected to in recent decades, fear of the Other rules. As a result, most property owners wouldn't even think of doing this kind of project, because they're afraid of being sued should someone get hurt. If the city extended its umbrella over the public use of these kinds of spaces, it would encourage more citizens to donate the use of private property for common use—as a garden, playground, picnic area, meditation spot, or whatever! So far, the City has not seen the benefit of this kind of initiative, though I think it would increase the complexity and variety of energy exchanges within the community as well as offer a wonderful template for other communities far and wide.



*Harvests from the garden are so sweet, especially when shared among the neighbors coming together for work and play.*

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## **...Elinor Ostrom, an IU professor and the 2009 winner of the Nobel Prize in Economics for her work on “the commons,” uses the Green Acres Neighborhood Garden as an example of a successful local commons.**

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On the other hand, some prominent voices in the community are appreciating what is happening with GANG. I've heard that in her public talks, Elinor Ostrom, an IU professor and the 2009 winner of the Nobel Prize in Economics for her work on “the commons,” uses the Green Acres Neighborhood Garden as an example of a successful local commons.

The second and newest challenge involves a dispute with a neighbor. She doesn't like the cob oven that the SPEA class built, and wants the city to tear it down. She says that the smoke gets into her windows, which on the one occasion that we've used the

oven, it did. I told her that we'd limit the use of the oven to once every two months, and that three of those occasions would likely be too cold for her windows to be open. But she remains obstinate, and the city Planning Department is trying to find a way to help us peacefully resolve the issue.

Now here's what's interesting about this challenge. When it first emerged, my instinctive response was to be glad! What? Why? Because we need “opposition” as a dialectical partner in the process of manifestation. Oppositions stretch us. As a fire throws embers ahead of itself on the wind, so does this challenge seed a fertile growing point. As we move through this difficulty with the neighbor and the city we will further embed the garden and all it represents in the consciousness of our town. △

*Ann Kreilkamp, 68, holds a doctorate in philosophy and runs the websites [www.exopermaculture.com](http://www.exopermaculture.com), [www.ganggarden.wordpress.com](http://www.ganggarden.wordpress.com), and [www.tendypress.com](http://www.tendypress.com).*

### **From the Green Acres Neighborhood Plan:**

“Our quest then, as a community, is to become healed, healthy, whole; so diverse, so stable and secure and that the winds of change, no matter how strong, will find us able to adapt and thrive. Ultimately, we hope to leave a legacy that we can be proud of, that does justice to the enlightened, far-seeing views of the family who bought the original 160-acre farm that evolved into our Green Acres neighborhood home.”

Read the entire document at: [bloomington.in.gov/media/media/application/pdf/52.pdf](http://bloomington.in.gov/media/media/application/pdf/52.pdf)

# Urban Agriculture—Depaving Paradise

David Tracey

**T**HE IDEA OF PUBLIC SPACE as something we have a right or even a duty to care about has withered. How and why this happened is difficult to understand, because it didn't come down by decree or all at once, but by a thousand corporate cuts. Every time a private interest chips away at our shared places, and we do nothing, we end up that much weaker as a society.

The tragedy of the commons is a conceptual model suggested by Garrett Hardin in the journal *Science* in 1968. It describes a cow pasture shared by a community of cow owners. Individual owners send their cows to the pasture to graze, which works fine so long as there are a few owners with a few cows, but as the numbers grow, the pasture gets crowded, and eventually destroyed. The tragedy is supposed to be that the commons doesn't work for a crowded pasture, or planet, because people will look out for their individual needs before those of the community. The essay is still used to get people to ponder the Earth's growing population and the Malthusian fears of hunger from many mouths to feed. But it turns out that's not the case. Hunger is not a problem of quantity: we grow enough food to feed everyone already. We actually have



*The site of Hastings Folk Garden before community members transformed it.*

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**One of the shortest routes from passive consumer to active food system designer is through the community garden.**

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a surplus. It's a problem of poverty: the poorest can't afford it. So it's the system that's flawed. The tragedy in the essay is caused not by the commons but by rampant individualism. Hardin himself once said he should have titled his essay "The Tragedy of the Unregulated Commons." The key is getting the community to agree on how to manage public space. This starts with the notion that there is a public space, that we even have a commons, and that it is good. It may also include the notion that the land we share needs healing, and farmers are the ones we need to heal it.

## ***Growing community***

Many hands make light work, the saying goes, and that holds true for the campaign to transform our cities into city-farms. An interesting aspect of the present rise in urban agriculture will be to see how unique city styles influence the way we collectively grow, harvest, package, sell, eat, and recycle food. Cities are social centers of innovation, cultural gumbos filled with a diversity of people, influences, and ideas. Of course, not all of them are good influences and ideas, but that's city life too. The point is, we do things together. Increasingly, this includes the way we grow our own food.

## ***What is a community garden?***

A community garden is not just about vegetables. It can be a farm, a playground, a school, a temple, a gym, a stage, a refuge, a wildlife habitat, and more—all on the same day. At best it derives its strength from and serves as a model for the community around it. Community gardens teach and celebrate values we cherish, including cooperation, volunteering, appreciation for diversity, and ecological awareness.

Some of the most inspirational ones I've seen have been in the neighborhoods that needed them most. At the Hastings Folk Garden in Vancouver's Downtown Eastside, ground zero for the city's social issues of homelessness, addiction, prostitution, and crime, a single city lot was turned into an organic food garden.

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Residents of the neighborhood did much of the heavy work.

Some didn't have homes themselves, which may be why the site turned into a farm that resembled an outdoor living room. All kinds of neighborhood people would drop in. Nurses would visit on breaks from the Insite safe injection clinic two doors away, the only legal facility in North America where addicts can use heroin, under medical supervision. Sometimes sex-trade workers would stroll in to pick a few raspberries off the vine, perhaps the only fresh organic food they would eat that day. Others would come in just to sit for 20 quiet minutes away from the chaos of the street. Urban agriculture is all about the food, but it can also be about much more than that.

### ***And one for all***

One of the shortest routes from passive consumer to active food system designer is through the community garden.

Sometimes I get asked to speak to a group of neighbors wondering whether they have it in them to start and run a community garden. The answer is usually yes, but not always. I remind them that community gardens don't just sprout and grow out of good intentions. They take a lot of cooperation, dedication and plain hard work. Which means not just one or two keeners but a strong group of people, the more the better.

I make it a point to remind them, "The most important word in community gardening is the first one." But sometimes I screw up the first/second word thing, confusing myself along with the audience, so I'll add this to mean the same thing: "Community gardens grow community." By that I mean they make people and communities healthier, more socially aware and more ecologically engaged. They also grow food where people live, which is the aim of urban agriculture.

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## **It may be a community of two, but that's all right, you have to start somewhere, and two is twice as good as one.**

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### ***Farm friendly***

Some cities are community garden-friendly, while other treat them like uninvited guests. Montreal falls into the accepting category. The city's first community garden, planted in 1975, was created when a group of immigrant residents asked if they could cultivate a neighborhood lot left empty by a fire. Fortunately for them the city official put onto the file was from the horticulture department, a garden person. He wasn't sure it would work, but

was impressed with their enthusiasm and went along on good faith. When it succeeded, and the neighborhood was revitalized, bringing a diversity of residents together for the first time, the idea spread to other parts of the city.

Montreal now has some of the most supportive policies for urban agriculture in North America. It has an estimated ten thousand community gardeners. All city residents receive a notice with their electricity bill asking if they're interested in joining a nearby garden. Zoning regulations protect food-growing spaces. The city pays for animateurs to explain growing techniques to beginners.



*The Hastings Folk Garden being created in Vancouver, BC.*

So if your own city official gives you the runaround when you ask to use some unproductive city land to grow food, have them understand it's not a new or crazy idea. You might even mention what happened to that horticulturalist in Montreal: he went on to become mayor. Naturally it never hurts to have friends in high places, but it was a citizen-led effort that made the city an example for others to follow.

On the other hand, Montreal is based more on the allotment style of community gardening. Also popular in Europe, this is often a city-managed operation in which the gardeners pay a small fee each year in return for a numbered plot they are free to tend as they like, within the regulations. Allotment gardens work well to get many people on the land, with the city or whomever manages the facility taking care of much of the work.

A more community-oriented community garden is one the members manage themselves. Often they're involved in creating, planning, designing, and building the garden. A city using this model usually has lower numbers of total gardeners. But it also usually gains in community development as the gardeners create their own sense of social harmony and civic engagement.

You can't automatically say one is better than the other, as both have their merits. Quantity and quality are both desirable aspects of the campaign to get more people growing more city food. But if I'm asked, I usually recommend quality. A commu-

nity garden at its best can be the best thing about a community, and that's a tough claim for any allotment garden to match.

### **How to start a community garden**

**First, get a community.** It may be a community of two, but that's all right, you have to start somewhere, and two is twice as good as one. Even a determined individual can burn out in a flash

## **A community garden at its best can be the best thing about a community...**

if others don't soon catch on. If your project is at all viable for the area you propose, people will join in once they see the opportunity. The lure of the sun-warmed tomato should not be taken lightly.

If you have a garden space in mind, put up a poster nearby calling for a meeting to discuss it. Or if you're still looking, get the word out by free Craigslist postings, public messages on the community radio station, leafleting the neighborhood and papering the local bulletin boards. Try to target groups who may not normally get the news. To reach the percentage of intercultural community gardeners we needed for our downtown Vancouver project aimed at building a more inclusive society, we put out notices in five languages and made sure the ethnic press listed our public info sessions and community dialogue events where we had volunteer interpreters on hand. Sure enough, half the people who showed up were foreign-born, and many had never grown organic food before.

**Next, get land.** This can either be the hardest part of the process or it can go swimmingly. There's no one strategy for securing the various types of land held by various government agencies or private jurisdictions. One thing that helps is numbers: the more people you have asking, the easier it is to make your case that starting a community garden on a particular spot is a worthy idea.

When searching for a site, remember that sun is crucial. I know it sounds obvious, but it continues to surprise me how many people—including city officials—will seriously consider areas under thick canopies or in the shade of tall buildings.

**You're obviously going to need water.** If the site doesn't have a hookup already,

you'll need to install it. This is where your good contacts with the city can be put to use. A simple hookup, if it includes a backflow valve, can cost several thousand dollars. That's a lot for a small band of would-be growers, but peanuts for a city that does them all the time.

**Plan your project with your newfound group.** You might start with a name. Then determine your "mission statement," which is typically an explanation of your purpose. It can be brief or elaborate, but brief is better because it makes you crystallize what your group is really about, and can be useful to refer to in later years when new people and new situations require everyone to get their bearings. Here's what the Urban Farming nonprofit group from Detroit has declared they're all about: "Urban Farming's mission is to create an abundance of food for people in need by planting gardens on unused land and space while increasing diversity, educating youth, adults and seniors and providing an environmentally sustainable system to uplift communities." The



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intercultural community garden I worked with in Vancouver decided on this for their purpose: “To promote intercultural relations between Canadian-born and non-Canadian-born residents of the downtown peninsula of Vancouver through organic, community gardening in a supportive, healthy and inclusive environment.”

**Next, do an asset check.** What will you need to start and manage a garden? Begin by listing what you already have. If you do this with a group, you may be astonished to learn how resourceful your own neighbors can be. This is true both in terms of materials—you could dig your way to China with all the shovels lying around people’s garages, and someone may also have a cousin with a backhoe—and in terms of skill and experience. Until you sit down together and someone asks, you may not know how many people can contribute their time as plumbers and carpenters and graphic designers and community organizers and landscape architects and lawyers and childminders and cooks and all the roles that add up to the social capital of a community.

**Get funds.** Community gardens can be launched and run on shoestring budgets, but you will eventually need some money—to buy shared tools or order a delivery of manure or plant some perimeter trees or get insurance (if required), and so on.

Community garden infrastructure costs can be kept low if you simply plant in the ground. Costs rise with more and better facilities. A fence can be expensive, in materials as well as in time if you’re putting it up yourself. One estimate by city staff from North Vancouver uses a standard rate of \$100 to \$150 per linear meter. That’s for a professionally constructed fence that will hold up for years. You

You may also need soil to fill up the first boxes or planting beds. Private companies where live I sell it for about \$30 a yard, plus a delivery charge of an extra \$50 to \$75. How many yards will you need? Multiply length by width by depth, then divide the total by 27. So for a box that’s four feet by six feet and two feet high:  $4 \times 6 \times 2 = 48$  cubic feet; divided by 27 it equals 1.7 cubic yards. A small pickup truck holds about a yard and a full-size pickup truck about two cubic yards.



*Hastings Folk Garden after its establishment. The garden grows community as well as it is tended by the people.*

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## The impact of a few neighbors getting together to talk about a better approach to food can seem slight, at first.

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can certainly do it cheaper yourself, and it may look that way, dismaying some, although a bit of wonky can add to the home-made charm. Maybe you don’t need a fence—some gardeners prefer the open and welcoming look. Or, to provide at least a psychological barrier to thieves and a real one to dogs, they install closely planted shrubs or *espalier* fruit trees as a living fence.

Raised-bed planting boxes can add considerably to your startup budget, depending on how many you need. The same North Vancouver estimate for boxes comes in at \$15 to \$35 per linear meter, or \$25 per linear meter for a 30-cm-high installed box, again depending on materials chosen.

### **Better together**

The impact of a few neighbors getting together to talk about a better approach to food can seem slight, at first. In 1965, a Tokyo housewife thought the milk in the local stores wasn’t that good, and expensive besides. She got some neighbors together to explore alternatives. They talked to others in turn, until the group was big enough to try buying in bulk directly from a dairy.

Thus began the Seikatsu Club cooperative. Today it has 22 million members, still mostly women.

The co-op’s website says Seikatsu Club members, “with the cooperation of producers, refused to remain as passive consumers who buy appealing goods one by one in the market, and we at SC are now creating food and other essential goods with a concern for safety for human health and the environment.” In 1989 the club won the Honorary Right Livelihood Award, the “alternative Nobel Prize,” for being an “alternative economic activity against industrial society’s prioritization of efficiency.”

The fundamental principles of the SC are:

- Create a new lifestyle in order to protect environment and health. Stop passive and resource-wasteful lifestyles based on commercialism.

- Abolish differentials and discrimination. Realizing that “prosperity” based on the sacrifice of other people both in and outside of the country should not be pardoned, SC promotes and

encourages fair trade.

• Establish autonomy of people. Stop following state control or an induction of commercial and industrial enterprises, but make every effort to create a community of autonomy and cooperation through our basic daily activities of collective purchase.

• Enable women, who are the majority of members, to be independent. Today's highly industrialized society pushed women and local communities into subordinate and decentralized positions. We are not only criticizing and confronting the situation, but are proposing to create a new lifestyle and alternative work.

Seikatsu means "life," and reflects the guiding philosophy that there's more to it than money. The co-op refuses to buy genetically engineered foods, has a campaign to reduce Japan's ridiculous over-packaging habits and, through an affiliated network, has elected 141 members to local assemblies. It also has a fund to help new workers' collectives such as bakeries and recycling centers. In 1993 it launched a campaign to improve Japan's food self sufficiency.

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**A simple glass of milk, a short row of carrots, an empty city lot spotted by a group of neighbor growers—anything can happen...**

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This is mentioned as a potential source of inspiration to start your own neighborhood conversations, perhaps beginning with food and how it is grown. And to point out that nothing happens until someone, maybe you, starts it. A simple glass of milk, a short row of carrots, an empty city lot spotted by a group of neighborhood growers—anything can happen when the seed of a good idea gets nurtured.

**Fourteen reasons to start a community garden—**

1. Get neighbors together.
2. Learn/teach organic gardening.
3. Create or improve green spaces.
4. Cut crime.
5. Build economic activities.
6. Lower family food budgets.

7. Encourage self-reliance.
8. Enhance food democracy.
9. Reduce "food miles."
10. Increase biodiversity.
11. Reduce storm-water runoff.
12. Support urban nature.
13. Promote volunteering.
14. Reintroduce the commons.

△

*Excerpted from Urban Agriculture, Ideas and Designs for the New Food Revolution by David Tracey, Chapter Seven: Return of the Commons: Growing Community, published 2011 by New Society Publishers. Copyright by the author and used here by permission with photographs courtesy of the publisher.*

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## The Revolution Will Not Be Microwaved:

# Food Means Access to Land

Sandor Ellix Katz

**W**ITHOUT ACCESS TO LAND, people cannot possibly create or otherwise obtain food. Security and survival depend upon access to physical, outdoor space: farmland, grazing meadows, foraging and hunting ranges, and shorelines for fishing. Unfortunately, getting such access is very often a struggle in itself. The histories of patriarchy, capitalism, racism, colonialism, and many other forms of oppression are long sagas in which people have been systematically torn from the specific ecological niches that previously sustained them, the unique places that are the basis of culture and its glorious diversity.

The earth is our mother. We all come from the mother, and to her we shall return. We are of the earth; it is absurd to imagine that we can “own” it, even in small pieces. And yet the earth has been divvied up as private property. Property is a legal concept, a cultural production, not an intrinsic quality of land. Notions of what can be privatized as “property” seem to be infinitely expansive: land is privatized; seeds and genes are privatized; and even water is privatized.

My old friend Bill Dobbs used to say, “Real estate determines culture.” He was generally describing urban phenomena and offering a materialist analysis for cultural trends, but I think of his words often in relation to our food system. Real estate determines

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## My old friend Bill Dobbs used to say, “Real estate determines culture.”

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culture when indigenous peoples, carrying on age-old subsistence lifestyles connected to the land where they live, are supplanted by land ownership. Real estate determines culture when productive small farms are forced to sell their land because their modest agricultural earnings simply cannot keep pace with rising property-tax rates and competing demands for golf courses, malls, and subdivisions. Real estate determines culture when urban community gardens, which brought vitality and activity to their neighborhoods, are doomed by their successes and auctioned off to the highest bidder.

The social construct we revere as “the logic of the market”

doesn't do a very good job of taking care of the land or of meeting most peoples' needs. When real estate is allowed to determine culture, that culture is an expression of domination. Culture needs to be liberated from real estate, and liberation movements everywhere have the reclamation of land as a central goal. “Revolution is based on land,” wrote Malcolm X in his 1963 “Message to the Grassroots” speech. “Land is the basis of all independence. Land is the basis of freedom, justice, and equality.”

The “commons” is an ancient tradition of land shared as a community resource, and what few commons remain are shrinking fast. In Britain the commons were privatized beginning in the mid-1600s, in four thousand individual “Acts of Enclosure,” culminating in the Great Enclosure Act of 1845. The enclosures literally starved many people, peasant farmers who historically had depended on common land for their food. This harsh reality rapidly transformed the formerly landbound peasantry into cheap factory labor and facilitated the Industrial Revolution. The Diggers and the Levellers were two

resistance movements that took down the enclosure fences as the landlords erected them. A Leveller tract of 1649 declared:

*The Work we are going about is this, To dig up Georges-Hill and the waste Ground thereabouts, and to Sow Corn, and to eat our bread together by the sweat of our brows. And the First Reason is this, That we may work in righteousness, and lay the Foundation of making the Earth a Common Treasury for All, both Rich and Poor; That every one that is born in the land, may be fed by the Earth his Mother that brought him forth, according to the Reason that rules in the Creation.*

This process of land privatization has been repeated around the world, as have movements of resistance to it. “This continual struggle shows that the current inequitable distribution of land and housing, though widely accepted by elected governments and even public opinion worldwide, is strongly disputed on an operational level by people with the short end of the stick,” writes Anders Corr in *No Trespassing: Squatting, Rent Strikes, and Land Struggles Worldwide*.

Here I look at movements struggling to retain and reclaim land for growing food. These activists include small-scale farmers searching for strategies that will enable them to hold onto their land, urban community gardeners reclaiming abandoned



*Part of the Famine Memorial in Dublin by sculptor Rowan Gillespie. In the 1840s, Ireland lost more than one million people to famine and emigration. Photo by William Murphy.*

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lots in their neighborhoods, and liberation movements taking land redistribution into their own hands, such as Brazil's Landless Workers Movement (MST), settling hundreds of thousands of people on large unused agricultural holdings. [I also look] at some activist movements defined by their separation from land, such as landless farm workers organizing for living wages and safe working conditions.

### **Land movements across space and time**

Virtually everywhere on the earth, indigenous peoples have been displaced, and conflicts over land rights, as well other questions of survival and self-determination, are ongoing. Certainly this is true in North America. "Struggles by native peoples to retain use and occupancy rights over our traditional territories, and Euroamerican efforts to supplant us, comprise the virtual entirety of US/Indian relations since the inception of the republic," observes writer, teacher, and activist Ward Churchill. "All across this continent," according to Anishinaabeg activist (and former Green Party vice-presidential candidate) Winona LaDuke, "there are native peoples—in small communities with populations of 100, 500, even 5,000—who are trying to regain control of their community and their territory."

LaDuke is the founder of the White Earth Land Recovery Project (WELRP). She lives on the White Earth Reservation, an area 36 miles square, or about 837,000 acres, located in Minnesota. "A treaty reserved it for our people in 1867 in return for relinquishing a much larger area of northern Minnesota" says LaDuke. "Of all our territory we chose this land for its richness and diversity." The Anishinaabeg have traditionally held land collectively. "In our language the words *Anishinaabeg akiing* describe the concept of land ownership. They translate as 'the land of the people,' which doesn't infer that we own our land but that we belong on it."

In 1887, in accordance with the federal General Allotment Act, the White Earth Reservation was divided into 80-acre parcels, one of which was granted to each individual residing on the reservation. Previously, the Anishinaabeg had shared the land on a communal basis. "The allotment system had no connection to our traditional land tenure patterns," says LaDuke.

"In our society a person harvested rice in one place, trapped in another place, got medicines in a third place, and picked berries in a fourth. These locations depended on the ecosystem; they were not necessarily contiguous. But the government said to each Indian, 'Here are your 80 acres; this is where you'll live.' Then, after each Indian had received an allotment, the rest of the land was declared 'surplus' and given to white people to homestead... What happened to my reservation happened to reservations all across the country."

"Real estate determines culture." When the property owners couldn't pay their taxes, the state confiscated their property. The vast majority of the White Earth lands were taken in this manner, along with about two-thirds of all reservation land in the United States, according to LaDuke. "Our struggle is to get our land back," she explains. "That's what we've been trying to do for a hundred years. By 1980, 93 percent of our reservation was still held by non-Indians." Today most of the Anishinaabeg live off the reservation. "We're refugees, not unlike other people in this society."

As most of the Anishinaabeg have been forced off their ancestral lands, the state has replaced them by designating those lands as hunting and fishing areas and timber lots. Forests are being clear-cut, and most of the deer and fish taken from the land are by people from off the reservation. "We are watching the destruction of our ecosystem and the theft of our resources," laments LaDuke. She refers to *minobimaatisiwin*, an Anishinaabeg word meaning the practice of living in harmony with natural law. "*Minobimaatisiwin* is our cultural practice; it is what you strive toward as an individual as well as collectively as a society. We have tried to retain this way of living and this way of thinking in spite of all that has happened to us over the centuries."

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## **The social construct we revere as "the logic of the market" doesn't do a very good job of taking care of the land or of meeting most peoples' needs.**

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To continue this practice, WELRP is seeking to reclaim its land one parcel at a time.

"We bought some land as a site for a roundhouse, a building that holds one of our ceremonial drums. We bought back our burial grounds, which were on private land, because we believe that we should hold the land our ancestors lived on. These are all small parcels of land... It is a very slow process, but our strategy is based on this recovery of the land and also on the recovery of our cultural and economic practices... Our work is about strengthening and restoring our traditional economy."

Continuing on the subject of native land struggles, LaDuke states, "It is absolutely crucial... that our struggle for territorial integrity and economic and political control of our lands not be regarded as a threat by this society." She emphasizes that there is plenty of land for us all, and that existing native claims amount to less than one-third of the US landmass. For those of us more recently transplanted to this land and seeking to develop deeper connection to it, our actions must respect the lives and lands of the earlier inhabitants. How can we value native foods without supporting the land claims of native people? Ward Churchill exhorts nonnative progressives and activists, "The land rights of 'First Americans' should serve as a first priority for attainment of everyone seriously committed to accomplishing positive change in North America."

The struggles of many different people for survival and decent lives are struggles for land. "In every period of known history and in nearly every society touched by forms of inequitable property, people have struggled for a more equitable distribution of land and shelter," writes Anders Corr. In Brazil, where land and wealth are distributed even more inequitably than in the United States, the Landless Workers Movement (MST) has mobilized more than a million people over the past 20 years to create settle-

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ments on unused land owned by large agricultural holders, and forced the government to make good on its long-time promises of land reform. MST has succeeded in obtaining legal ownership of 20 million acres for 350,000 families in 3,000 settlements. “In every settlement we visited,” report Angus Wright and Wendy Wolford, North American authors of a book on the MST, “people were enjoying a level of comfort, security, nutrition, education, health care, and sense of community participation that is remarkable among the Brazilian rural poor.” When people have access to land, their opportunities to meet the rest of their needs are vastly increased.

Land reform as a political agenda has had many different expressions and has been motivated by different forces. The United States supported post-World War II land redistribution as part of occupation and reconstruction in Japan and Germany—modeling it on the traditional American farming model, just then beginning to erode—and justified land expropriations with the theory that the rise of fascism was due in part to the concentration of land and political power in the wrong hands. Nevertheless, the United States has supported the concentration of land and political power in the hands of large holders, most notably in Latin America, where large landowners in many cases have been US citizens and corporations. For if one thing is worse than a fascist concentration of land, according to the capitalist mindset, it’s a communist expropriation of private property and redistribution of land.

In 1945 more than half of Guatemala’s farmland consisted of plantations larger than 1,000 acres, yet less than a fourth of the acreage of these plantation holdings was under cultivation. One US corporation, United Fruit (now known as Chiquita), was the largest employer, landowner, and exporter in Guatemala, growing and exporting bananas, primarily to the United States. United Fruit prospered in Guatemala largely because it was able to secure the support of government officials there.

In 1950 Guatemalans elected a new president, Jacobo Arbenz Guzmán, who initiated a land reform policy of expropriating uncultivated portions of large plantations and redistributing the land in small plots. Around 1.5 million acres were taken and divided among 100,000 families. Some of the expropriated land belonged to United Fruit, which undertook a propaganda campaign in the United States to promote the idea that this represented the spread of communism to the Western Hemisphere.

Newly elected President Dwight Eisenhower was a Cold War warrior eager to combat the perceived communist threat. In addition, various members of his administration had direct ties to United Fruit. The U.S. Central Intelligence Agency (CIA) hatched a secret plot, code-named Operation Success, that overthrew Arbenz in 1954, aborting the political process there and throwing Guatemala into a state of repression and violent civil unrest that has persisted ever since.

Chile is another Latin American nation in which a US-backed military coup followed attempts at land reform. On September 11, 1973, its popular socialist president Salvador Allende was murdered and a military dictator named Augusto Pinochet took power. Pinochet dismantled Allende’s land reforms and shifted Chilean agricultural policy toward export markets and foreign investment. Thanks in large part to this intervention, Chilean grapes are plentiful on wintertime US supermarket shelves. Aren’t we lucky!

In 2005 Venezuela granted more than 300,000 acres of land

to indigenous groups, returning to them control of their ancestral territories. “What we’re recognizing is the original ownership of these lands,” said President Hugo Chavez. “Now no one will be able to come and trample over you in the future.” A coup was attempted against Chavez in 2002, and prominent American broadcast commentators have freely suggested that the US government assassinate him, but so far he remains in power.

Like Venezuela, Chile, Guatemala, and Brazil, Mexico has had some government-sponsored land reform. Traditional communal indigenous land holdings were guaranteed in Mexico’s 1917 constitution, which remains in force to this day; however, these land provisions, contained in Article 27, were revised in 1992, to bring Mexico’s land into the private ownership system in accordance with the terms of the North American Free Trade Agreement (NAFTA). This abandonment of indigenous land rights propelled the Zapatista movement, composed of mostly

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## Land reform as a political agenda has had many different expressions and has been motivated by different forces.

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indigenous people in the state of Chiapas, to take up arms. “We and our families have been sold down the river, or you could say that they stole our pants and sold them,” explained Zapatista spokesperson Sub-Comandante Marcos in an interview at the time. “What can we do? We did everything legal that we could do so far as elections and organizations were concerned, and to no avail.” On January 1, 1994, the day NAFTA went into effect, armed Zapatista rebels seized towns in eastern and central Chiapas, declaring their intention to claim sovereignty on behalf of Mexico’s people and to overthrow the Mexican government.

The Mexican army responded militarily, but support for the Zapatistas—both within Mexico and abroad—was so strong that the president ordered a cease-fire on January 12 and created a Commission for Peace and Reconciliation to negotiate with the rebels. The agreement the commission finally reached in 1996, known as the San Andrés Accords, recognized the autonomous rights of indigenous pueblos. However, Mexican president Ernesto Zedillo rejected the agreement.

The Zapatista rebels continue to hold a portion of Chiapas, hemmed in by Mexican troops. They have established 37 autonomous *municipios* that have provided people with land, education, health care, and other services and continue to demand autonomy for indigenous communities. The Zapatistas have inspired people around the world. The word *zapatismo* has become an expression to describe any bold assertion of indigenous rights. *Zapatismo* involves both a love of the land and respect for its people. Δ

*This excerpt is from The Revolution Will Not Be Microwaved: Inside America’s Underground Food Movements by Sandor Ellix Katz (Chelsea Green Publishing, 2006). www.chelseagreen.com.*

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# Native American Management and Eco-Cultural Restoration in Colorado

Eric Toensmeier

**I**N JUNE, I TAUGHT a five-day workshop on edible forest gardens for the Woodbine Ecology Center in Sedalia, Colorado. Their work for Native American self-determination and eco-cultural restoration inspired me to emphasize native species and indigenous traditions of landscape management. Woodbine is located at the edge between the Rocky Mountains and the prairies, so it has many species to draw on as well as a fascinating history to reconstruct. The organization's goal is to change diet and land use practices among the communities it serves to restore health in people and in ecosystems.

The course was planned to introduce the concepts of edible perennial polyculture, but many interesting ideas emerged during the workshop, so the Woodbine team decided to expand the project. The first phase will draw on books such as Daniel Moerman's *Native American Ethnobotany* and other resources to identify useful species of the region and what is known of their traditional management. During subsequent phases, we will interview indigenous people who manage or have managed these species and landscapes, will establish more species and practices at Woodbine, and will develop regenerative enterprises for economic development.

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## Much of what is now the United States, from New England to California, was managed by indigenous people as a vast acorn-producing forest or savannah.

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The following is an excerpt from the first phase of the project, which will be released later this year.

### *Forms of indigenous management*

In recent decades, the indigenous cultivation of native plants and ecosystems has been granted more and more acknowledgment in academic, land management, and ecological restoration circles. An important voice in this movement has been M. Kat Anderson, whose 2005 book, *Tending the Wild: Native American Knowledge and the Management of California's Natural Resources* is a detailed and fascinating study of traditional practices. It is increasingly apparent that indigenous peoples across the continent and around the globe created similarly rich cultures of land and resource use.



Keith Zaltzberg with thicket of American plum (*Prunus americana*) in fire-managed prairie at the Weaver Dunes Preserve in Minnesota.

These techniques confound Western definitions of "agriculture" and "wilderness." They occur on a continuum from the intensive cultivation of domesticated annual plants to the rotational burning of "wild" areas. These practices are summarized as follows.

- **Regenerative Harvest:** The season, intensity, frequency, and long-term patterning of harvest can have positive or negative effects on perennial plants. Native peoples developed harvest techniques to maximize the health and yield of their crops. Root crops like camas (*Camassia quamash*) and sunchoke (*Helianthus tuberosus*) are examples of plants that were harvested annually. Other plants were harvested on multi-year cycles to allow the stands to recuperate.

- **Horticultural Practices:** "Wild" and cultivated plant populations were managed by burning, irrigation, weeding, tilling, pruning, and coppicing (pruning back to the ground) to maintain healthy and productive stands. Chokecherries and hazels were fire-pruned to improve both fruiting and the quality of craft materials they yielded.

- **Propagation:** Plant populations were increased by sowing seed, transplanting, and transporting species or superior varieties to new locations, sometimes far outside of their natural range. Examples of these practices include the sowing of edible grass seeds onto newly burned areas, and the spread by Native people of species such as native lotus (*Nelumbo lutea*) and improved clones of agave (*Agave spp.*) to new areas.

- **Ecosystem Management:** Native practices, especially burning, maintained a productive landscape mosaic of desired ecosystems and habitats. The largest scale example is the fire-management of the prairies, large portions of which would have reverted to shrubland, savannah, or forest without indigenous burning.

• **Cultivation and Domestication:** Some crops were taken into active cultivation, sown among settlements or in farm fields. Many of these species developed the increased yields and dependence on humans that we call domestication. Sunflowers (*Helianthus annuus*), devil’s claw (*Proboscidea spp.*), and a number of grasses are examples.

### The importance of burn management

Frequent, low-intensity burns were common throughout North America and are an example of a multifunctional appropriate technology. With sophisticated agroecological knowledge and simple tools, Native people were able to increase the productivity of the landscape with minimal effort. Some of the functions of fire include pest and disease control (as in traditional oak management for acorns), pruning to rejuvenate useful plant stands, removal of competing “weed” plants, maintenance of desired ecosystem types and successional stages, increased game animal habitat, and prevention of catastrophic fires. Fire appears to have been by far the most widespread indigenous management technique in what is now the US.

### Indigenous management in the region

Within the prairies, the southern Rockies, and the Great Basin, the intensity of land management varied greatly. That the prairies

were burned frequently to increase productivity is well documented. Indigenous management of the Rocky Mountain and Great Basin regions, however, is less well known.

From the literature, it appears that parts of the Rockies were managed by fire (as well as other practices), while other areas, particularly higher, more desolate sites, may have been left to their own devices. Fires may have been set on a less frequent



Fire-maintained oak savannah at Weaver Dunes, Minnesota.

### Recorded Horticultural Management Practices

Care of “wild” plants in local ecosystems, not “cultivated” in gardens or farms.

Scientific name	Common name	Practices used
<i>Allium spp.</i>	Wild Onions	weeding, cultivation, burning
<i>Amaranthus spp.</i>	Amaranth	sown after burning
<i>Apiaceae</i>	Umbel family roots	burning
<i>Camassia quamash</i>	Camas	weeding, cultivation, harvest rotation
<i>Chenopodium berlandieri</i>	Huazontle, pigweed	sown after burning
<i>Cornus sericea</i>	Red Willow, Redtwig Dogwood	burning, pruning, coppicing
<i>Corylus americana</i>	American Hazel	burning
<i>Corylus cornuta</i>	Beaked Hazelnut	burning
<i>Cucurbita foetidissima</i>	Buffalo Gourd	seeding
<i>Helianthus tuberosus</i>	Jerusalem Artichoke	weeding
<i>Opuntia spp.</i>	Prickly Pear Cactus	pruning, weeding
<i>Pinus edulis</i>	Pinyon Pine	pruning, burning
<i>Pinus monophylla</i>	Singleleaf Pinyon	pruning, burning
<i>Poaceae</i>	Wild Grasses	burning, harrowing, seeding
<i>Prunus virginiana</i>	Chokecherry	burning
<i>Psoralea esculenta</i>	Prairie Turnip	harvest rotation, seeding
<i>Quercus gambellii</i>	Gambel Oak	burning
<i>Sambucus mexicana</i>	Mexican Elderberry	burning
<i>Typha spp.</i>	Cattail	burning
<i>Vitis spp.</i>	Wild Grapes	burning, pruning
<i>Various species</i>	Wild Greens	burning

cycle than in other parts of the country, perhaps between 25-35 years. As a whole, the Rockies and the Great Basin were not as intensively managed as coastal California, the prairies, or the agricultural areas of the Southwest and East. Reconstructing management practices for the Woodbine project has relied largely on accounts of indigenous management of the same species in different regions. The response of profiled species to fire has also been used to cast light on how they would have responded to burn management. A remarkable number of the useful plants profiled benefit from fire.

Today, the Rocky Mountain region provides little of its own food, particularly at higher elevations. It seems reasonable that Native peoples also focused their management efforts on the more fertile and hospitable areas.

### A word about tense

This article is drawn largely from historical accounts, which include ethnobotanical interviews well over a century old. These sources almost uniformly refer to Native people and their cultures in the past tense. It is a goal of this report to investigate the current state (and future potential) of indigenous species and prac-

tices. The plant profiles given below describe uses and management in the past tense where those practices are only confirmed to have been used in the past; it also notes where practices are in contemporary use.

### Sample Rocky Mountain and Prairie species

**Gambel Oak, Scrub Oak (*Quercus gambelii*).** Gambel oak is the primary oak species of the southern Rockies and Great Basin region, growing abundantly in many habitats from montane shrublands to canyons and at low- to mid-elevation slopes. It usually grows as a multi-stemmed tree from 10-25' (3-8m). Under ideal conditions it can reach 60' (18m).

Long before corn and wheat were domesticated, acorns were a staple crop. The nuts are rich in carbohydrates and oil, are produced copiously, and are easily processed by simple methods. However, wild oaks do not produce heavy crops every year. They are mast bearers, which means that they set crops at 2-5 year intervals, in part to control populations of seed predators such as



Buffaloberry thicket (*Shepherdia* spp.) near Basalt, Colorado.

squirrels. Bitter tannins, present in the acorns of all oaks to some degree, must be removed by leaching. Like most storable crops, acorns also require processing, including shelling, grinding, and drying. Gambel oak has fairly small acorns, but they are less bitter than some. Gambel oak is also used in many other ways, from timber and firewood to dyes and medicine.

Much of what is now the United States, from New England to California, was managed by indigenous peoples as a vast acorn-producing forest or savannah. Periodic, low-intensity fires killed pests and diseases that affect acorn production, and controlled some competing plant species. Low-intensity fire and certain harvesting practices provided nutrient cycling and regenerative pruning. In California, where oak species with large acorns are diverse and abundant, acorns were central to Native American life. Native management in California, which continues today in some areas, is considered

a sophisticated agroforestry system, incorporating fire, pruning, and other strategies. In addition to maximizing acorn production and other oak yields, this system maintains an understory rich in wild game, edible fungi, and useful plants including camas, wild onion, and biscuit root. M. Kat Anderson's *Indigenous Uses, Management, and Restoration of Oaks of the Far Western United States* is a fascinating study of oak culture.

Gambel oak is particularly tolerant of fire. It responds to low-intensity fires with vigorous re-growth, and re-sprouts even after intensive burns.

**Silver Buffaloberry (*Shepherdia argentea*)** is an attractive, silvery-leaved shrub of western North America. It spreads by underground runners to form large colonies, sometimes expanding for miles along riverine corridors. It also grows in drier areas, and tolerates very poor soils due to its ability to fix nitrogen.

Silver buffaloberry can produce heavy crops of berries. These become quite sweet after frost, and are eaten fresh, dried, in juice, or in jellies. The seeds can be chewed or ground up with the flesh for drying. A yellow-fruited form with sweeter fruit occurs naturally and is available from some nurseries.

This species was used heavily by Native people across its range, particularly on the northern prairies. Historical accounts indicate that two people could harvest 30 bushels in a day (a remarkable amount!) by spreading cloths under the bushes and beating the trunks with sticks. Buffalo berry bushes are top-killed by fire but re-sprout quickly. They are well adapted to fire management and would have benefited from indigenous burning anywhere it was practiced—as it was throughout much of the species range.

The related russet buffaloberry (*S. canadensis*) has a similar range and appearance, but its fruit is quite inferior due to the presence of bitter, soapy saponins. This species was, however, used quite extensively as a medicinal by Native peoples.

**Riverbank Grape (*Vitis riparia*).** The wild grapes of the western region are vigorous woody vines, growing high in trees along riparian areas and in moister forests. Riverbank grape grows wild across most of the US and, interestingly, has become common in

### Highly Fire-Tolerant Useful Trees and Shrubs

These species re-sprout vigorously after fire.

Scientific name	Common name
<i>Celtis reticulata</i>	Netleaf Hackberry
<i>Cornus sericea</i>	Red Willow, Redtwig Dogwood
<i>Corylus cornuta</i>	Beaked Hazel
<i>Prunus americana</i>	American Plum
<i>Prunus pumila</i>	Sand Cherry
<i>Prunus virginiana</i>	Choke Cherry
<i>Quercus gambelii</i>	Gambel Oak
<i>Rubus</i> spp.	Raspberry, Thimbleberry
<i>Shepherdia</i> spp.	Buffalo Berry
<i>Vitis riparia</i>	Riverbank Grape
<i>Yucca baccata</i>	Banana Yucca

urban areas often forming thickets in vacant lots, on chain link fences, and along highway guardrails. Grapes prefer to have their roots in shade, with the vines climbing and emerging into the sunlight.

The small, tart fruits are borne in clusters. They have seeds and are quite a bit more sour than cultivated grapes, but make delicious juice, baked goods, and dried fruit. The young green shoot tips and tendrils can be eaten, and the leaves can be used in various ways (like stuffed grape leaves). The vines are very useful in basketry.

The Pueblo Indians cultivated the canyon grape (*V. arizonica*), and some writers have recorded the indigenous cultivation of native grapes in New England. *Tending the Wild* reports that in California, the management of wild grapes included burning in August, as well as selective harvest and pruning to maximize basketry yields. Grapes are very easy to propagate—sections of vine, cut when dormant, can be stuck in the ground. About 50% will grow into new vines. Thus is it easy to imagine that superior wild varieties of grapes were transplanted to new locations in this fashion, particularly as sections of vine were already transported in large numbers for use in basketry.

**Banana Yucca (*Yucca baccata*).** This mid-sized yucca was an important staple food and multipurpose plant across the southern Rockies, the Great Basin, and the desert Southwest. In fact, according to *Native American Ethnobotany*, the fruits were the second most widely used food plant in North America. Banana yucca favors dry plains and slopes, and is found in many plant communities from sagebrush scrub to pinyon and oak forests.

Each plant produces large fleshy fruits (5-8" long) every 2-3 years, depending on the available moisture. Though the fruit is sometimes eaten raw, written accounts indicate that it is usually boiled or baked by burying in the ashes of a fire. After cooking, the skin, seeds, and fibers are removed, and the sweet nutritious fruits may be eaten or preserved by drying. These dried fruits store for a long time. The fruits are sometimes harvested while still green to avoid competition from wildlife, and allowed to ripen in a safer location. Fruit stalks were also sometimes

partially broken to hasten ripening. The seeds can be roasted and eaten, though this was apparently less common. The flowers and asparagus-like flower stalks are also edible. Banana yucca is an excellent fiber plant, and its historical use for basketry and cordage ranked it the #4 most-used fiber plant in North America according to *Native American Ethnobotany*. The roots are a good botanical source of soap. Flower stalks and flowers of many other yucca species are also edible.

Banana yucca grows in many habitats that were historically managed by burning. The plant responds well to fire, re-sprouting quickly.

**Umbel family roots (*Apiaceae*).** This family of plants features many domesticated species, including vegetables (carrots, parsnips, celery, and fennel) and herbs (dill, parsley, caraway, cilantro, cumin, lovage, angelica). Members of this family are widespread through western North America in many different habitats. Many umbels have tubers or fleshy taproots that store energy and water to help the plant survive the dry season.

Many members of this family are edible, medicinal, or both. They include some of the plants most widely used historically by Native people. *Native American Ethnobotany* rates common cow

## What does the emerging understanding of indigenous practices mean for the North American permaculture movement today?

**Common, useful plants for the Front Range Eco-Restoration Project**

Latin name	Common name	Habitats	Uses
<i>Cymopteris spp.</i>	Gamote, Springparsley	Semi-desert, canyons	Edible roots, leaves
<i>Heracleum spp.</i>	Cow Parsnip	Moist open woods or prairies, riparian areas, montane meadows	Edible roots, leaf-stalks, flowerstalks, medicinal
<i>Ligusticum spp.</i>	Osha	Open woods, thickets, grasslands	Edible leaves, medicinal
<i>Lomatium spp.</i>	Biscuit Roots	Prairies, semi-desert, open woods	Edible roots and leaves, medicinal
<i>Osmorhiza spp.</i>	Sweet Cicely	Montane and subalpine woodlands	Edible leaves and roots, medicinal
<i>Perideridia spp.</i>	Yampah	Moist open meadows and hillsides	Edible roots, medicinal

parsnip (*Heracleum maximum*) as the sixth most widely used species overall, and fernleaf biscuitroot (*Lomatium dissectum*) as the #4 most widely used medicinal. Some of the edible roots, notably yampah and biscuit root, were important Native staple carbohydrate foods. Many of these plants are still very much in use by Native people today, including osha and yampah. Typically, edible members of this family have edible roots and parsley-flavored foliage.

**Caution:** several species in this family are deadly if eaten, and very closely resemble edible species. Multiple deadly species are found in the Prairie and Rocky Mountain regions. Do not experiment with food or medicine from this family without an expert.

*Tending the Wild* presents extensive

documentation of indigenous management of members of this family in California. Many were “wild-cultivated.” Selective harvesting improved future production. Cultivation during harvest loosened soil, and root segments, mother plants, or seeds would often be replanted to ensure the next harvest. In the case of Gardner’s yampah (*Perideridia gardnerii*), this practice continued for so many centuries (or millennia) that the plants developed easily-broken branched roots. This adaptation ensured that every harvest would replant the next generation; it represents a form of semi-domestication. Patches of umbel family plants were also burned at appropriate times to maintain optimal habitat conditions for growth. Plant breeder and botanist Luther Burbank reported patches of yampah “growing like grass, so that hardly a shovel-ful of dirt can be turned over without exposing numerous roots” (*Tending the Wild*, 241). Similarly dense patches of yampah and osha are found today in the Rockies, and may represent formerly wild-cultivated stands of these species.



*Wild plant assembly including Gambel oak (Quercus gambelii), osha (Ligusticum spp.), raspberry (Rubus idaeus), and nitrogen-fixing golden banner (Thermopsis spp.). All are native to the eastern Rocky Mountain foothills.*

### **Buffalo Gourd (*Cucurbita foetidissima*).**

This perennial squash is native through much of the prairie and Southwest regions. It grows in full sun in prairies and disturbed areas, making remarkable growth in dry soils. A single plant can produce 15,000 abrasive, rank-smelling leaves. The vines form roots wherever they come in contact with soil, creating huge colonies of the plant that are useful to control erosion and stabilize slopes.

The seeds, like those of many pumpkins, are usually roasted and ground. These contain 30% oil and 32% protein, and yields can reach three tons per acre in desert regions. The enormous roots can weigh as much as 178 pounds. They are incredibly bitter, but can be processed to extract their 20% starch content. The roots are also used medicinally to treat many conditions.

Buffalo gourd is currently under development as a starch and oil crop for arid regions. Historically, it was seeded by throwing the softball-sized fruits into suitable locations—a practice continued today by urban guerrilla gardeners in California. The plant is considered a weed by many farmers, as it grows around the edges of fields and spreads aggressively.

**Amaranths (*Amaranthus spp.*) and Chenopods or Goosefoots (*Chenopodium spp.*).** These closely related native annuals are widespread throughout North America. They are “weeds” of disturbed habitats, including garden and farm fields and around human habitations. Some form of amaranth or chenopod probably grows in every corner of the world, and they are used in similar ways everywhere. In the Rocky Mountain and prairie regions, the primary species are redroot amaranth (*A. retroflexus*) and pitseed goosefoot or native lambsquarters (*C. berlandieri*), though many other native and naturalized species are present.

The young leaves of amaranth and goosefoots are highly

nutritious as cooked vegetables. Amaranth especially is cultivated for this purpose in many parts of the world. The seeds, which are high in protein in both grain amaranth and quinoa (*C. quinoa*), are important staple crops internationally. Processing of the seed requires several stages, as with most staple seed crops. Huauzontle (*C. nuttalliae*) is a chenopod that was domesticated in northern Mexico as a broccoli-type vegetable.

Wild amaranths and chenopods were intensively collected for both seed and leaves across the western region. Seeds were scattered in suitable areas by many peoples, and the Paiutes among others sowed them after burning an area, for improved production of “semi-wild” stands. Weedy amaranths and chenopods in crop fields were tolerated and utilized. Amaranths were cultivated in California, the Southwest, and possibly the prairies. In Mexico, amaranth cultivation was second only to corn though, due to its religious importance, it was heavily suppressed by the Spanish. Chenopods (*C. berlandieri*) were domesticated in Illinois, and cultivated in the Midwest and in the Ozarks. Quinoa, a staple in the Andes, is now a commercial crop in the Rocky Mountains.

### **Implications for contemporary permaculture**

What does the emerging understanding of indigenous practices mean for the North American permaculture movement today? I think we should begin with giving credit where credit is due—much of what we know today as permaculture is drawn from indigenous practices, as acknowledged by Bill Mollison in *Permaculture: A Designers Manual*. Robert Hart also explicitly stated that he sought to imitate traditional tropical practices in his development of cold-climate forest gardens (*Forest Garden-*

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ing, and with J.S. Douglas, *Forest Farming*). Recognizing Native achievements in land management, and acknowledging what we have learned and have yet to learn from these sophisticated practices, removes some of the invisibility that centuries of racism and genocide have put in place.

We can also support indigenous communities in their efforts to restore traditional management on as much land as possible. For example, the Maidu Stewardship Project is working to restore 2,100 acres of National Forest land to indigenous management. Access to land and the right to manage it is a key to community self-determination.

Rafter Sass has defined permaculture as “meeting human needs while improving ecosystem health.” Native practices appear to have realized this goal on a very large scale in many areas, and offer us elegant models based in sophisticated regional knowledge, minimal work (controlled burning as a management tool), and a diverse range of yields for meeting human needs.

Reading *Tending the Wild* and other descriptions of indigenous management, I saw echoes of these practices in my own forest garden management. Now I am struggling to understand the potential implications of practices like regenerative harvests, broadscale ecosystem management, and long-term coppicing for forest gardening and farm-scale food forestry. All are really forms of designed disturbance such that every harvest or interaction maintains or improves the long-term productivity of the ecosystem, habitat, or stand of species.

Those of us who live where fire-management is feasible can experiment cautiously with reintroducing this ancient practice (no doubt many permaculturists already are, please write up your experiences for the *Activist!*) Even if we can’t use fire as our

cepts in permaculture is to leave intact ecosystems alone, and use them as teachers. Surely this still has value, but we need to understand that there are probably missing partners in the ecosystems we mimic.

Growing up in the environmental movement, I learned that the highest environmental standard to which we could hold ourselves was to reduce our impact on the planet—that our touch was inherently damaging. In the changing view of wilderness and our place in it that an understanding of Native management history brings, it becomes more clear to me that the goal is not to reduce our impact on nature, but instead to optimize it. For thousands of years, vast swaths of our continent were anthropo-



*Buffalo gourd (Cucurbita foetidissima) creates useful microclimates and helps to protect and build dry soils.*

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## **This emerging history should also cause us all to reevaluate our concepts of “nature,” “wilderness,” and “agriculture.”**

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primary management tool, we can use other forms of designed disturbance to maintain productive landscapes with diverse habitat mosaics, such as rotations of livestock, coppicing, and the use of farm machinery.

This emerging history should also cause us all to reevaluate our concepts of “nature,” “wilderness,” and “agriculture.” Most deciduous forest and prairie in the U.S. and Canada was actively managed, as were extensive evergreen forests in the Southeast, Southwest, and California. What does ecological restoration mean in this context? Should untouched virgin forest really be our model for healthy ecosystems? One of the fundamental con-

genic (human-created) ecosystems, co-evolving with humans and actually requiring their stewardship to maintain the highest level of diversity of habitats and species. Regardless of how closely we may choose to mimic indigenous practices in our farms and gardens, surely we can benefit from examples that express so many of the ideals of permaculture: low maintenance, productivity, and the harmonious integration of people and landscape. △

*Eric Toensmeier is the author of Perennial Vegetables and co-author with Dave Jacke of Edible Forest Gardens. His collaboration with Woodbine has resulted in the paper of which this article is an excerpt. His writings, videos, and upcoming workshop schedule can be viewed at [www.perennialsolutions.org](http://www.perennialsolutions.org). To read more (including profiles of over 80 useful plant species with many tables), or to support upcoming phases of the Woodbine ecological restoration project, visit [www.woodbinecenter.org](http://www.woodbinecenter.org). The Woodbine Ecology Center is nestled in the foothills of the Rocky Mountains, and features 61 acres of alpine, prairie, and riparian ecosystems. Woodbine brings together people and communities from varied backgrounds to address the fundamental social and ecological issues of our times, creating an egalitarian, just, and sustainable future for the next seven generations.*

# Hoarding and Saving Seeds

Carol Deppe

**S**EED SAVING IS MUCH TALKED ABOUT. It involves growing plants in such a way that the seed is genetically pure and genetically what it should be, then cleaning and processing it. There are several books on seed saving, including my own, *Breed Your Own Vegetable Varieties: The Gardener's and Farmer's Guide to Plant Breeding and Seed Saving*. In addition, I discuss seed saving specifically for corn, beans, and squash in *The Resilient Gardener*. Seed hoarding, however, isn't generally discussed. By seed hoarding, I mean laying down a supply of seed for long-term storage. The seed may either be seed you have saved or seed you have bought.

In my freezer are gallons of seeds, specially dried and sealed in glass jars. Most of it is seed I have grown. I can expect that seed to last as long as the freezer and the electricity last plus (for the corn, for example) at least another ten years. I think it is a good idea to have such a backup supply of seed for all varieties that really matter to me. Whenever I come to appreciate some new variety, my first step isn't saving the seed. My first step is simply buying extra, drying it properly, and freezing it. I don't save seed of every variety I use. But I have learned how. And I do try to have a stash of every variety I use. Should it become impossible to buy the seed, I would have enough seed to grow a crop and to start saving the seed myself from that point on.

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**It is possible to produce hand-saved seed that is prime beyond anything possible on a commercial scale.**

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To freeze seed you need to be able to seal it in jars or other airtight containers. Much commercial seed is not dry enough for that. The seed continues respiring slowly, and needs oxygen. The seed needs to be dried more thoroughly, which puts it into a deeper state of dormancy. After the more thorough drying, the seed can be sealed in airtight containers and frozen. To get the seed dry enough to seal in glass jars or freeze requires a lower humidity than is found naturally in most places. So I dry our seed in a dehydrator at 95°F for the right amount of time, until the indicating criteria say that it is dry enough. The biggest indicator for corn and beans and other legume seeds is the "hammer test." That is, take some seeds out to the sidewalk or driveway and hit a few of them with a hammer. If they shatter, they are dry enough to seal in airtight containers and to freeze. If the seeds smash

instead of shattering, they are still too wet.

After you remove a jar of seed from the freezer, always give it a day to warm up naturally before you open it. Otherwise, moisture condenses on the seed, and it is too much of a shock.

If you don't have a freezer you can still hoard seeds. Dry them as described and seal them in airtight containers. Then replace each lot of seed with fresh seed occasionally. (For most seed, once every five years will do.) Store the containers of seed in as cool a place as you have. Hidatsa Indians hid caches of seed in the ground as they left summer villages for winter villages. I haven't quite figured out how to store containers of seeds in the ground for more than a few years. (The metal lids would rust. Most plastic disintegrates.) But even a few years might be useful.

I prefer to hoard seed I have saved myself. It is possible to produce hand-saved seed that is prime beyond anything possible on a commercial scale. Such seed has astonishing longevity and vigor. For example, six-year-old corn seed of mine that has been fully dried and stored in a glass jar at room temperature germinates faster and more vigorously than most freshly bought commercial seed. Last spring my gardening partner Nate and I planted six-year-old flour corn seed, most of which had been stored at room temperature. It was a breeding project, and we wanted every seed to count. Nearly every seed came up. I doubt if we were "missing" more than a dozen seeds in the entire field of a few thousand.

Of course, I do save seed (and breed) for crops and varieties I care about the most. I breed my own varieties so I can select for varieties that have spectacular flavors, and that do well under organic growing conditions, that thrive without seed treatments and on modest levels of water and soil fertility, that are resistant to everything relevant in my garden, and that are optimally adapted to my region and my growing methods and purposes. To do my own plant breeding I have to be able to save seeds. In addition, I save my own seeds because that gives me the best quality. And so I don't have to worry about other people crossing up or changing the varieties. Or about importing diseases. I also save seeds because the price is right. And because saving seeds is such fun. I love to harvest, thresh, and clean seeds. I love to run my fingers through them, play with them, and array them in jars on shelves where I can see and take joy in them.

To save seeds is to complete the circle. When we save seeds, we are plant breeders, choosing which germplasm to perpetuate. We incorporate our values into our seeds. We spread our values along with our seeds. Thus do we help create and shape the next generation of the Grand Alliance. △

*Carol Deppe gardens in Oregon's Willamette Valley. This excerpt is from The Resilient Gardener by Carol Deppe (Chelsea Green Publishing, 2010) and is used here by permission of the publisher. [www.chelseagreen.com](http://www.chelseagreen.com).*

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# Gardening Religion

David Haberman

**I** PROPOSE, as a lifelong student of world religions, that considerable connections exist between the garden and religion, and that understanding these connections is a vital part of our efforts to take up more prudent and responsible ways of inhabiting the planet.

Religious narratives are human creations, but are frequently vital ones that both express and determine our sense of reality. Since human life can in many ways be regarded as a process of living a story, it is imperative that we consciously consider the stories we live. The best known religious story in the Western world about a garden is that of the Garden of Eden, a good place to begin while pondering the relationship between religion and the garden. I once heard Peter Bane say: “We didn’t get kicked out of the Garden; we left it.” Not claiming to know exactly what he meant by this statement, I intend to use it as a springboard into exploring issues it raises for me while reflecting on the mythological narrative of Eden.

Besides the many fruit and nut trees that provided divine gifts of food, there were two special trees in the Garden of Eden: the Tree of Life and the Tree of Knowledge. God invited humans to eat from all trees except the Tree of Knowledge, but this was a



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**Religious narratives are human creations, but are frequently vital ones that both express and determine our sense of reality.**

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set up. God must have known that by marking this one tree as off limits we were guaranteed to eat its fruit, just as a child who is put in a room alone with several boxes and given permission to open all the boxes save the special one, will inevitably open the forbidden box. Many Biblical interpreters have pointed out that God in this story planned this to happen, because God wanted humans to have free will, freedom of choice. Without this we would lack consciousness, we would act in a robotic fashion, and would be unable to fulfill our role as conscious partners in creation. The destiny of humans is to be fully conscious beings, and for this, freedom of choice is essential. Numerous Biblical commentators have called the incident that took place in Eden a “holy fall.” The divine model for the proper mode of human being in the world is indicated in God’s response to the whole creation at the end of Genesis 1.1 in the form of the utterance: “God saw everything that he had made, and behold, it was very good.” This declara-

tion involves both aesthetic and ethical attitudes toward the entire natural world. God’s design for human beings according to this story is to join freely in wonder-filled appreciation and care of all life.

## *The garden is ours to choose*

God created a beautiful, bountiful garden of abundance for all creatures to enjoy. The sacredness displayed in the garden is the central mystery of life: the ongoing eruption of that ever-renewable, ever-resilient, ever-expansive, ever-complexifying, and nurturing quality of life. We need to work with it, not against it. According to the story of the Garden of Eden, however, the first act of human free will was to reject the garden, to reject God’s will and creative process. There is admirable boldness in this act, but in the end there is no more freedom in simply doing the opposite of something than in never being allowed to oppose it; acting contrary to a rule still demonstrates the controlling influence of that rule. The divine plan for humans is to participate willingly in the creative process, but by rebelling and attacking the very source of our life, we humans put ourselves in peril. We began cutting down the trees that had provided abundance, making room for a world we thought to be better than God’s creation. Defiantly, we would do anything but follow the will of God inherent in the garden. But this defiance has consequences.

Today, we work incredibly hard to gain a mere fraction of what is already offered to us in the sacred gift of the world garden. We clear-cut forests to build shopping malls in support of a life that is neither healthy nor satisfying. We are now turning our chainsaws to the Tree of Life itself, with the result that much life on Earth is seriously threatened. But it is not too late. Hope exists, for remnants of the garden survive. We need to discover

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those remnants of the garden closest to us, to cherish and protect them. It is necessary to study them carefully so that we can learn from them and replant the garden by replicating them elsewhere as we take up the restorative work of gardening. We still have the opportunity to harmonize our wills with the will that is encoded in the garden. We are yet offered a chance to learn from nature and to become gardeners, co-creating a world of abundance instead of environmental destruction. God stands lovingly at the entrance to the Garden of Eden with arms wide open, ever ready to welcome us back. The ticket of re-admission is acting harmoniously with the will manifest in creation itself. The crucial choice before us today is to decide which of our creations are in harmony with this directive, and which are not. If they nurture the Tree of Life they are; if they harm the garden or cause us to turn our back on its many creatures they are not. We did not get kicked out of the Garden; we left it of our own free will. Exercising our will in an appropriate way, we can return whenever we choose and be nourished by the ever-vital Tree of Life that stands at the center of the garden.

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## Future historians of religion will look back on this time as a significant period of religious warfare.

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I am aware that quite different interpretations of the story of the Garden of Eden from the one I have articulated above exist. There are those who believe that the Garden is no longer accessible to us here on Earth, or that if it is accessible it has no ultimate value. Our true destiny lies elsewhere; we are urged to leave the world garden for a heavenly city far away. Many who hold this view regard the garden as a cursed place; some of them are even willing to destroy the world garden with the hope of finding a better place in some other realm. For these, God is conceptualized as highly transcendent and greatly removed from world processes; he is a harsh judge who warns us to renounce all bodily connections to the world garden.

I believe that if they exist a hundred years from now, future historians of religion will look back on this time as a significant period of religious warfare. Much is at stake in the current conflict, for the very future of the human presence on Earth depends on its outcome. Although I have come to be very wary of reductionistic approaches to the place and value of religion in human experience, I also recognize that in a general way two oppositional attitudes toward the world have existed in virtually every one of the world's religions. At the risk of oversimplifying the great diversity to be found within these religions, I want to draw attention to the nature of these two attitudes and explore their implications for human behavior toward the nonhuman world. To be clear, I am not referring to any conflict between one religion and

another, but rather to conflicting perspectives that can be found within most all religions.

### ***The religious choice: this world or another***

On one side of the conflict there are those who assert that our true home is elsewhere, that we are just sojourners on our way to some other place somewhere else. In the best case scenario, these typically look at life on Earth as a backdrop to the human drama or as a testing ground for some type of spiritual examination; in the worst case, they regard it as some kind of prison to be escaped. The religious goal in this context is often articulated as some kind of liberation from the incarceration of life on Earth. Examples of this might include the view of the world articulated by the Hindu philosopher Shankara, the early Christian desert father Origen, early theoreticians of Buddhist monasticism, as well as other advocates of asceticism found in a number of world religions. A more relevant and potentially alarming example would be the relatively new form of other-worldly American Christianity that has arisen in conjunction with certain right-wing politics in the last few decades. James Watt, Secretary of the Interior under Ronald Reagan, gave apt expression to this reli-



gious position when he reportedly responded to concerns about increased logging in our national forests by declaring that our real concern should be with the “next world” and not this one. Jerry Falwell, spiritual advisor to George Bush, Jr., said something similar. Clearly, the world garden does not have much value from this perspective, and any love of natural phenomena or processes is suspect. In Baconian fashion, the natural world is regarded in aggressive terms and often treated as a menacing adversary or a mere warehouse of profitable material resources. One might add that this perspective typically involves a devaluing of the body and a disassociation of the self from the world.

On the other side of the conflict there are those who believe that the world is a precious creation or divine gift, perhaps even a manifestation of divinity itself. The world garden is our home, and a good one at that. One might think of the “very good”

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creation of Genesis or the view of the world expressed in Saint Francis of Assisi's *The Canticle of the Creatures* within Christianity, the understanding of the world as a manifestation of the goddess Durga or the god Krishna in the *Devi Mahatmya* or *Bhagavad Gita* respectively within Hinduism, the conception of the entire world as imbued with Buddha nature within the *Lotus Sutra* and other Mahayana Buddhist texts, as well as the view of the world that can be found in any number of the more Earth-based religions practiced by many indigenous peoples. Perhaps more relevant to contemporary American Christianity, today there are a number of theologians who have argued compellingly for the sacrality of the natural world. The ecofeminist and Biblical theologian Sallie McFague, for example, has eloquently articulated the notion that the whole world is the "body of God," and is therefore eminently worthy of our respectful attention. The goal here is not to escape the world, but rather to appreciate and enjoy it as a living and sacred entity. Within this religious perspective the world has ultimate value, and is to be loved and cared

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**We understand that religion matters greatly in the transformative efforts in which we are already engaged...we comprehend that all religious views are not the same.**

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for with special reverence. Moreover, this perspective typically involves a positive evaluation of the body and an understanding of the self as deeply entwined in a radically interconnected world.

A very different ethic emerges from each of these two perspectives. In the first, there is really no ultimate need to care for this world which is viewed as a mere stage for the human drama; our attention is directed to another world elsewhere declared to be far more valuable. In the second, this world is understood to be of immense value as part of a divine creation, and is worthy of intimate attention. In declaring that Care for Earth gives ethical meaning to its work, permaculture clearly adopts the latter perspective. Again, much is at stake in the difference between these two positions. If the first dominates our societies, the world garden will be neglected, even spoiled. These are not good conditions for effective restoration or healthy growth. On the other hand, the garden is likely to receive greater attention and nourishment if the more this-worldly and life-affirming forms of religion come to dominate our society. It is high time for a second coming into the Garden!

## **Getting back to the garden**

As the child of God whom Joni Mitchell quotes in her song "Woodstock" says: "We've got to get ourselves back to the garden." The question is, what kind of religion is going to help us get back to the garden? A central permaculture idea is to design from pattern to details. I submit that the most radical idea we can hold and act on is, simply put: All Life is Sacred! Here is the general pattern from which we need to work out the details. The mantra that All Life is Sacred is also very much in line with an awareness that ecology—which acknowledges the interconnectedness of everything—is increasingly the metaphysics of our day. The propagation of religious views that both flow from and support such realizations may be the most important actions we can take toward gardening religion, and thus of framing the ethics and worldview of the coming centuries.

Despite many predictions to the contrary, religion does not seem to be going away; it appears to be an essential feature of human culture. (It can even be argued that to a large degree everyone's sense of reality is significantly affected by religion, whether they identify themselves as religious or not.) Rather than keeping a distance from it, I suggest that there is need for permaculturists to get into the game and garden religion, particularly to help shape the religion that dominates our society. This is critical work since religion determines so much of human behavior. Short of this, the arena is left wide open to people with very different agendas. Specifically, we all need to cultivate and encourage what is often called the "greening" of religion or making religions more "eco-friendly;" in the words of Aldo Leopold, we need to promote religious views that "include nature in an expanded morality." Lynn White, an early proponent of such developments, wrote: "More science and more technology are not going to get us out of the present ecologic crisis until we find a new religion, or rethink our old one." White believed that it is much more timely and prudent to reform the existing religions than for whole societies to acquire new ones.

## **Designing new forms of religion**

One important way of doing this is by taking an active role in shaping the tenor of religion within one's own community. Dare I say helping to design healthier forms of religion for our communities? In his book *Permaculture: Principles and Pathways Beyond Sustainability*, David Holmgren observes: "Spiritual beliefs about a higher purpose in nature have been universal and defining features of all cultures before scientific rationalism. We ignore this aspect of sustainable cultures at our peril." Understanding that the religious or spiritual dimensions of human culture are essential to a healthy planetary future, Holmgren edges near the suggestion that designing religion is part of our work: "The deliberate design of a new spirituality that reflects ecological realities may be an unrealistic and dangerous extension of the permaculture agenda. However, an organic growth of spirituality from ecological foundations promises more hope for the world than the increasingly strident clashes between religious and scientific fundamentalism." While I recognize the many challenges we face in this work, I am urging us to take up this critical endeavor and to get our hands dirty by gardening the rich soil of religion.

Recognizing that religion is a human institution that will not go away does not mean that it is impermeable to change; on the contrary, as a human product it is always subject to change, taking different forms throughout time as determined by different historical challenges. As a cultural institution, particular religions or religious interpretations (like languages, which have been disappearing in large numbers) are fragile. Although there is a potentially alarming aspect of this realization, it also points to a bountiful possibility. Here is an opportunity for more gardening by permaculturists, who understand that small changes can have great effects. Besides tending plant worlds, we need to cultivate healthier cultural worlds, and this certainly includes religion. We all need to become active gardeners of religion, the primary definer of ultimate values in our societies. This means in particular that we understand that religion matters greatly in the transformative efforts in which we are already engaged, and further, we comprehend that all religious views are not the same. We need to leave behind the irenically motivated but false notion that all religions are one. Understanding the need to nurture life-supporting religious perspectives and to weed out those



that sap vital energies by negating the value of the world before us, we should explore and lift up those life-affirming aspects found in the scriptures, teachings, and traditions of the particular religions that influence our communities. Many resources could be mentioned as useful aids for this work, but perhaps the best is the profuse website of The Forum on Religion and Ecology now based in the Yale University School of Forestry and Environmental Studies, which addresses all major religions (<http://fore.research.yale.edu>). There are many fruitful opportunities to apply the spiritual wisdom and practices of past ages now viewed with new eyes to current challenges. These include reforming our relationship with the nonhuman world, rethinking the burning issues of energy and consumption, and much-needed efforts to develop

more compassionate and all-inclusive communities. This resurrection of submerged but still potent life-affirming perspectives is particularly needed in the case of the religions of the United States, which is a behavioral model for so much of the world. Today we are witnessing a significant political and religious battle that will determine whether our society (and by extension much of the world) will be based on a kindhearted and equitable vision (informed in large part by religion) or one that is chiefly uncaring and elitist (informed in large part by religion). I used to say that everyone in this country—regardless of religious affiliation—has a great deal at stake in the future of American Christianity, since

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## I am urging us to take up this critical endeavor and to get our hands dirty by gardening the rich soil of religion.

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it is clearly the dominant religion of the land. I have now altered this to include all planetary residents, since the religious views of America are having a huge impact on the whole world.

Another important contribution to the labor of gardening religion is the support of those theologians already promoting the more life-affirming side of this country's religions, particularly the ecologically sensitive ones working to steer the future of American Christianity in a direction more harmonious with healthy life processes. These theologians work persistently—as theologians have for centuries—to design their own religious tradition according to a particular interpretation, while simultaneously steering it away from others. They often work against great odds and can use favorable support in pushing the success of this development along a saner course.

We didn't get kicked out of the Garden; we left it—or perhaps we were seduced out of the garden by false promises of industrial abundance and genetically modified leisure. Glancing back as we begin to slide down the slope of energy descent, many of those promises look highly suspicious, as do the pushers still invested in promoting them. Martin Luther King once said: "The most radical thing you can do is to grow your own food." Here are words from a religious leader with down-to-Earth commitments. The home garden is an effective swale that can capture and store energy of many kinds. As we fashion our gardens and learn to grow our own provisions, we also need to cultivate food for thought and action about the ultimate systems that determine so much of our socially shared sense of reality. In short, we need to become active gardeners of religious worldviews and practices that will allow us to get ourselves back to the Garden. △

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# Practical Small-Scale Farming & Gardening

## Lifting the Garden Up

Sepp Holzer

**R**AISED BEDS HAVE A SUBSTANTIAL ADVANTAGE over normal beds that are at ground level. They create microclimates, which according to their position, relative to the course of the sun and the prevailing wind direction, provide very different plants with the conditions they need. The beds are built loosely, which helps the soil to retain more water, and they soak up rainwater like a sponge. The water is stored in the lower levels of the beds and the hollows between them, while the raised part dries out far more quickly. The result is both dry and wet areas. It is also my experience that the raised part of the beds warms up more quickly, which is a great advantage in colder climates and at high altitudes. Well-aerated and correctly-planted raised beds can help to slow down the freezing of the topsoil. If the beds are made of organic material, the inner part of the bed will slowly begin to decompose. This releases heat, which in turn improves the conditions for germination and plant growth. The decomposition also releases nutrients, which makes it possible to cultivate more demanding varieties of vegetable without using fertilisers. The shape of the raised bed provides a larger area for cultivation. On small plots of land—like town gardens—gaining this extra space is particularly important. Finally, building raised beds offers many exciting possibilities for garden and landscape design.

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**There is no template for the perfect raised bed in Holzer permaculture, because the beds can have very different dimensions.**

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### Design ideas

In a number of gardening books it is becoming increasingly common to find instructions for making raised beds. Most of them give dimensions for the perfect raised bed to the centimetre. These kinds of detailed instructions make it easy to construct the bed exactly as it is described. Free thinking and creativity are quickly lost. There is no template for the perfect raised bed in Holzer permaculture, because the beds can have very different dimensions. During the planning stage, I consider the local conditions and the individual requirements of the people who will be managing it. Although the beds can vary considerably in

their dimensions, all of them create the positive effects that I have already described.

The beds vary in height, length, width, and shape according to function, location, soil conditions, and the preferences of those involved. Flat areas of land in particular offer a variety of interesting aspects to experiment with: the beds could be made in wavy lines of different heights, they could form a half moon, a maze or a circle. In the centre of the circle there could also be a pond. In Burgenland, for example, I made a crater garden. In the summer, a beneficial humid microclimate develops in the crater. This provides a number of very interesting possibilities for cultivating plants.



*Simple raised beds in a forest garden.  
Photo by Ryan/Phoenix Hill.*

Even the way the foundations of my raised beds are made varies to reflect local conditions. I do not think it is necessary to state exactly how the layers should be arranged or what material should be used to make the foundations. It makes the most sense and is far more economical to work with

the material that is already to hand.

For many years, I chipped branches, shrubs, and trees and mixed them with earth to make raised beds. This made for very exhausting and laborious work. Eventually, I tried making a raised bed without chipped material; instead I incorporated thick branches and entire shrubs into the bed. This bed gave a far greater yield than I had expected. The reasons for this were obvious: when spreading the chipped material I had to be very careful; I could not incorporate too much wood (no more than a fourth of the material) into the bed. I also had to make sure that the material was spread very loosely, so that it would not compact.

Substances like resin can also be released too quickly into the earth causing the pH value of the soil to sink. In the worst

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cases the soil acidifies and the yield suffers. I found that introducing much bulkier material had exactly the opposite effect. Although the raised bed tends to be much larger and higher when entire trees are incorporated into it, the aeration of the system is vastly improved. The bulky material causes small shifts to occur throughout the bed as it slowly breaks down and as it responds to changes in the moisture content of the soil. It contracts and expands again, which keeps the structure of the bed loose.

Bulky material rots down more slowly, which lessens the danger of the soil becoming acid or of the crops being overfertilised. Tree trunks are also excellent at maintaining a balanced level of moisture within the system. This kind of raised bed is particularly good for growing potatoes and other root vegetables, I have also used them to cultivate cereals. I have had good results using these beds in spruce forests as well. Raised beds of this type can last for ten years or more without any major rebuilding, which is much longer than ones made with wood chips.

In November 2002, my simple method of building raised beds came in useful again when large areas of the extensive spruce monoculture in Lungau suffered storm damage. The heavy winds caused serious damage to the monotonous forests surrounding the farm. Today, they are still dealing with the fallen trees. On the Krameterhof the damage was minimal. The only victims of the storm were some small stands of spruce that were awaiting official permission for clearing and recultivation. A few of them fell onto my fruit trees and fences.

My plants happily withstood wind speeds of up to 170km/h (110 mph). I incorporated the fallen spruces I found into my raised beds just as they were. As the opportunity was there, I decided to build a couple of open shelters and new paddocks for my pigs out of the remaining wood from the fallen trees. It is always better to make the best of a situation instead of just complaining.

Wood from trees blown down by storms usually fetches a low market price. When there is suddenly so much of it, it is normally very difficult to get a good price for the wood at all. In addition to that, a great deal of useful timber is lost, because the tree trunks have snapped in the middle. The large number of fallen trees makes it dangerous as well as expensive to get vehicles in to remove them. Frequently, the cost of clearing the trees is greater than the money made by selling the wood.

These examples should make it clear that creativity and imagination are what you need most to build raised beds. The way you organise your land is entirely up to you. You only need to make sure that it fulfills its purpose and that the areas which require harvesting are easily accessible. It is also a good idea—if possible—to build at least two raised beds next to each other. In the hollow between the beds moisture is retained for much longer, which is very useful during hot summers.

### ***Designing a raised bed system***

Before you start building a raised bed system, you should find out what direction the wind usually comes from and take note of it. The simplest way to do this is to tie a strip of material to a tree or pole and observe it regularly over a period of time. You should also check it at night. This way you can find out very quickly which direction the wind comes from and which areas are the windiest. If necessary, a windbreak can be put up around the system or the entire system of raised beds could be

positioned against the wind and used as a windbreak itself. I find that raised beds planted with fruit bushes and tall-growing plants like sunflowers, Jerusalem artichokes, or hemp make the best windbreaks. I build these beds to a height of at least 1.5 metres (5'). They are exactly like normal raised beds, except that I make the sides a little steeper. This way the beds will not compact so quickly under the increased pressure. With raised beds that are higher than three metres, I put a narrow terrace on the top. This makes managing and harvesting the bed easier. The higher the bed is, the more space will be taken up and you will need to allow for this in your plans. Raised beds not only make good windbreaks, but also make excellent visual barriers and keep out noise and pollution. Frequently, it is enough just to have these windbreaks surrounding the system. I can also angle the beds to give them more sunlight. On steep slopes this is not so easy, because you also have to take into account where the surface water drains.

With raised beds on hills it is very important to pay attention to the flow of water within the system. The beds must not be par-

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## **I have had good results with even steeper beds of 60 to 70 degrees...**

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allel to the slope, otherwise those at the top of the hill will absorb all of the water when it rains, whilst the beds at the bottom will, in the worst case, begin to dry out. Water must be supplied evenly to all of the beds. The water must not be allowed to channel either or it could lead to landslides. The alignment of the beds in relation to the hill should be determined by the course rainwater takes down the slope.

A system of raised beds can be built by hand or with a mechanical digger, although only relatively small material can be incorporated into the beds when they are built without using machinery. As my experience has led me to favour bulky materials for constructing raised beds, diggers are indispensable for me. I use the digger to make a ditch 1–1.5m (3–5') deep and around 1.5–2m (5–7') wide. I carefully remove the humus layer and separate it. Then I place shrubs and trees along with their roots into the ditch. On top of that I loosely heap a mixture of earth, fine organic material, and turf. Finally, I take the humus that was removed and place it over the bed.

If there are no trees or shrubs to use for the bed, I have to make do with turf. Having additional organic material brought in from elsewhere would waste far too much time and energy.

The sides of the raised beds should, depending on the material, be at an angle of at least 45 degrees. I have had good results with even steeper beds of 60 to 70 degrees on heavy loam. Even with a bed made entirely of earth, a steeper angle makes sense. With some materials it is necessary to heap the earth as steeply as possible, as high as it can be and still hold together. When I am visiting other farms or giving advice, I see far too many raised beds that are much too flat. They ask me why the bed is not growing as well as they had hoped. The answer is simple: the angle of the sides is too shallow, so the beds become compacted.

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The supply of oxygen is decreased, the process of decomposition is interrupted and, if not dealt with, a foul-smelling anaerobic sludge can build up, which has a negative effect on the plants. In addition, the plants will not be able to establish their roots properly, because the ground is too compacted and they will begin to wilt. People continue to make raised beds that are too flat, which makes it all the more important for me to emphasize this point right now.

With wet, heavy soils it is a good idea to put in a drainage system to prevent water from building up. A French drain can be used to do this. With dry and sandy soils, on the other hand, it is important to keep water within the raised bed for as long as possible. This will happen automatically without any additional water being diverted, as it will collect naturally in the hollow between two beds and in the centre of the bed as the bulky material rots down. Covering the surface of the bed with mulch will also stop plants from drying out when they are taking root and are vulnerable.

When the seeds have been sown and the plants are developing, keeping the soil covered will stop them from drying out too much. Crops that are not harvested and other self-set or wild plants can be left on the bed as mulch, which will develop slowly into a rich layer of humus. Having deep, coarse humus and keeping the soil covered are the best ways to retain moisture.

The height of the beds depends on personal preference. I usually create beds with a height of between 1–1.5m (3–5'). This allows people of average height to harvest the beds without difficulty.

### ***Managing raised beds***

It is best to sow and plant raised beds as soon as they are created. As the soil has only just been piled up it is still very loose and has not yet begun to settle. Plants find it easier to establish themselves and take root in loose soil. Seeds fall through the loose soil and are not blown away by the wind so easily. The rain will not wash them away, but instead wash them further into the bed. So as not to hinder this effect, the beds should not be smoothed over. If you are planning to crop vegetables and fruit bushes successively, you should, if possible, plant the bushes on top of the raised bed. The vegetables below can then be reached quite easily. Organising the crops in this way is a particularly good idea in warm, sunny climates, on dry soils and when cultivating plants that need partial shade. Selecting which fruit bushes to use and the intervals at which they are planted allows you to regulate the amount of shade. It is also possible to combine them with fruit trees if you want the whole system to be in shade. Fruit trees and bushes can also be planted between the beds.

The distance between the individual beds can be altered to suit what is being grown. When you are designing a raised bed you should always take into account how you are planning to manage the bed and what equipment you will be using to do this. Otherwise there may be some unpleasant surprises later on. For example, if I want to use a tractor to harvest the fruit, I have to allow enough space for a path between the beds for the tractor to travel along. This path could, for example, be planted with different varieties of clover for plant cover.

Raised beds are suited to growing all kinds of vegetables: peas, beans, salad, tomatoes, radishes, cucumbers, carrots,

courgettes, pumpkins, potatoes and many others. The material breaking down in the centre of the bed provides the plants with plenty of nutrients and the plant growth will be lush. The amount of time the nutrients last or how quickly they are used up depends on what the centre of the bed is made of. If a raised bed is made of chipped wood, which breaks down quickly, a large amount of nutrients will be released in the first year. To make the most of this I select plants that demand a very high nutrient content: pumpkins, courgettes, cucumbers, cabbages, tomatoes, sweet-corn, celery and potatoes to name a few. In beds like these it is better to cultivate less demanding plants like beans, peas, and strawberries after three years. If they are planted any earlier they might become overfertilised. Overfertilised plants do not develop a good flavour. With some plants, e.g. spinach, nitrates can also build up in the leaves of the plant, which can be dangerous to ones health if eaten.

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## **These examples should make it clear that creativity and imagination are what you need most...**

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Raised beds constructed with bulky material such as whole tree trunks do not develop a particularly high nutrient content in the first year. The bulky material rots down very slowly. However, the supply of nutrients will be steady for many years and there is hardly any danger of overfertilising within the first year. To use a raised bed in the most effective way, you should take into account the nutritional needs of the plants.

I deal with any unwanted plants as I wander around the farm. I simply pull them up and leave them there with their roots facing up. If the weather is very dry and it is around midday, then this is even more effective, because the plants dry out and do not take root again. Mulching, in other words spreading straw, hay, leaves or similar organic matter, is a good way to keep these unwanted plants in check; it also keeps the soil covered and retains moisture.

From the second year, pigs can be allowed on the raised beds for a little time to graze after the harvest. As they search for food, they will till the beds and leave manure. The best fruit and vegetables should be harvested, but enough should be left for the pigs. They should have something to motivate them and make them happy. If too many pigs are allowed to graze in a small area, they can do a great deal of damage. The number of pigs and the amount of time they are allowed to graze must be determined by the available space. When they have worked the soil, it is in the perfect condition for sowing.

Depending on the weather and how they are used, the raised beds flatten gradually over the years. They are then either rebuilt or replaced. △

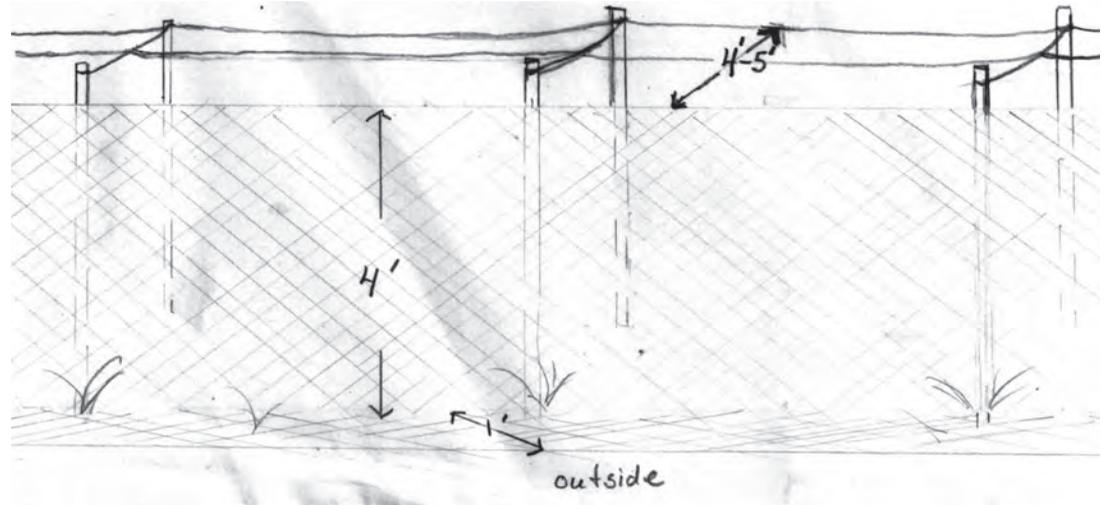
*Excerpted from Sepp Holzer's Permaculture: A Practical Guide to Small-Scale, Integrative Farming and Gardening by Sepp Holzer (2011) and used by permission of Chelsea Green Publishing.*

# A Better Deer Fence

Nina Maclean

I LIVE IN THE MOUNTAINS of Montana and for three years I have successfully kept the numerous deer, elk, and moose out of my 2.5 acres garden and young trees. This has been done without the expensive, imposing, eight-foot high prison yard deer fence so common. My fence is only 4' high, made of five-foot chicken wire on metal posts. One foot of this five-foot wide chicken wire is bent to lie on the ground toward the outside. This closes the gaps on uneven ground, and prevents small animals from digging a hole, which later the deer would use. Another key to the success of this fence is two strands of string or wire running parallel to the top of the fence on the inside. These are strung a little over two and four feet to the inside, and are also four feet high. Metal posts hold the wire that is four feet to the inside, but the middle (two feet to the inside) wire, is suspended between short wire connections between the inside and outside posts. These two inner wires seem to deter the deer from jump-

ing over this four-foot fence. The resident elk herd and frequent moose, which can walk through such light fence, have also stayed



out. The inner strands can support vines, and I have planted wild plums, caragana, and nanking cherries along the chicken wire. In a few years, it should be more of a living fence. It is so inexpensive and easy to construct, that I can take it down as trees mature, or move it to a new area. △



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# Hidden Connections of the Indoor Garden Greenhouses with Altitude

Jerome Osentowski, Evan Granito, Elena Zubulake & Sara DeAloia

THE CASUAL OBSERVER may view greenhouses as fairly straightforward systems: you keep out pests and frost, and you let in light and pollinators. The simplicity of this reductionist approach has tempted many accomplished gardeners. However, this view of a greenhouse as merely a tool for production is very limiting. Greenhouses present an opportunity to bring paradise indoors. With a little thoughtful design, they can (and should) be just as dynamic and complex as the forest gardens and wild areas surrounding them, and without all the risks involved with planting outside. At the Central Rocky Mountain Permaculture Institute (CRMPI) in Basalt, Colorado, we are expanding the possibilities of permaculture through dynamic high-altitude greenhouse design.

## Multiple functions in the greenhouse

In ecosystems, each element serves many functions. Chickens, for example, provide meat, eggs, manure, and feathers; they produce carbon dioxide and methane; and they promote propagation by dispersing seeds and keeping insect populations in check. Another bird, the hummingbird, can even pollinate the plants. We also find in nature that every function is supported by several elements; this creates resilient systems. One vital planetary function is the liberation of oxygen from carbon dioxide, a process carried out with the help of trees and other green plants, microorganisms in the soil, and even ocean plankton.

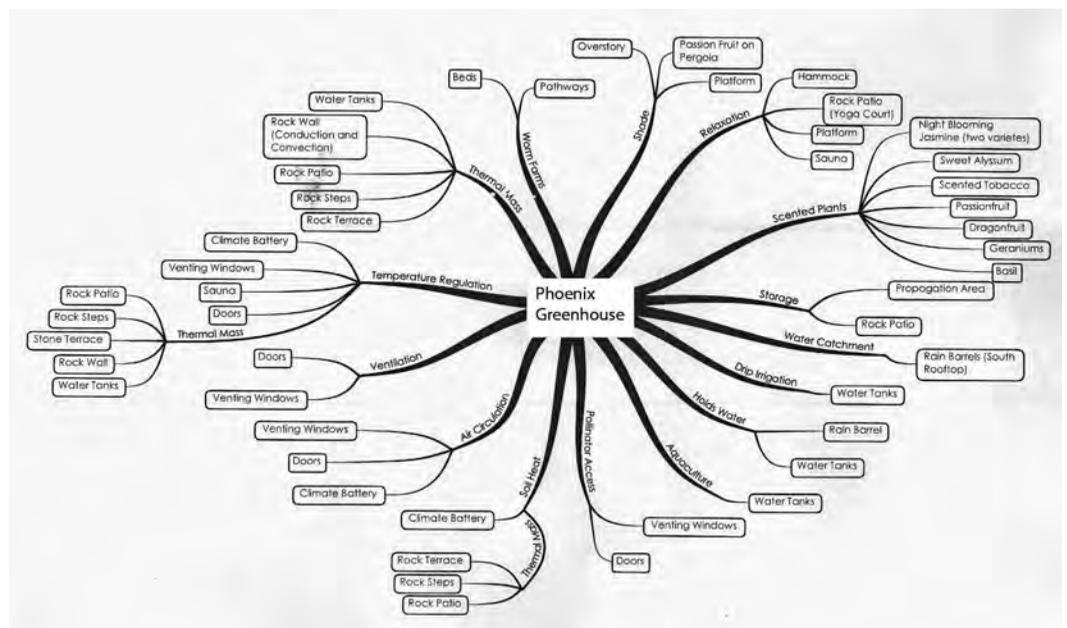
With a permaculture approach to greenhouse design, each function is similarly supported by multiple elements. The elements can be either architectural or biotic. Some of them are obvious, but others are hidden. The more features there are supporting essential greenhouse functions, the more productive and efficient the greenhouse becomes. This is the way nature works outside of the greenhouse walls, and it sets the standard that we try to emulate within. Few greenhouses exemplify this idea as well as Phoenix, our main greenhouse here at CRMPI (Like the mythical firebird, it was regenerated from the ashes of an all-consuming fire.)

Phoenix's primary products are fruits and vegetables, but it also provides comfortable habitat for medicinal and culinary herbs, worms, and fish, and yields natural fertilizers and propagated plants for our indoor and outdoor

gardens. It is also a hub of human activity. An attached workshop provides support for building and repair projects, and a built-in sauna offers its healing qualities in addition to serving as a supplementary heating system. There are opportunities to practice your shot with a bow and arrow on the archery range, to work or relax on "Pebble Beach"—the rock-lined hammock lair—and even a sleeping platform offering a peaceful night's rest at the end of the day.

## Greenhouses present an opportunity to bring paradise indoors.

Phoenix was created based on the three tenets of permaculture; Care for Earth, Care for People, Share the Surplus. Reflecting its thoughtful design and construction, this space is conducive to rest and relaxation, socializing, work, teaching, exercise, healing, and sleep in addition to its more traditional function of food production. Let's explore some of the hidden connections and stacked functions that make this greenhouse so successful at 7,200 feet above sea level.



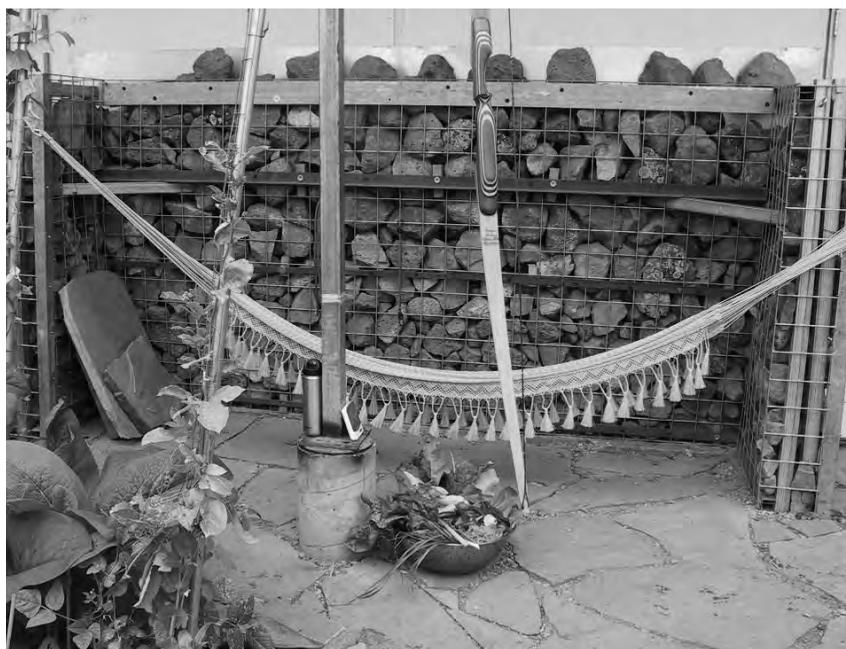
Connections in the Phoenix greenhouse at CRMPI. With a permaculture approach to greenhouse design, each function is supported by multiple elements.

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Remember, as you read, that the structural elements we describe in the beginning are essential to developing the greenhouse as a successful system. In designing this or any greenhouse, we begin by considering the aims for the system: How does it feel when you enter the space? What activities must be done within it? How easy will it be to move around? What will be grown? The more we can imagine and envision at this stage, the more rewarding will be the results.

### **Thermal mass**

Temperature is regulated in many ways in the greenhouse—by vents, shading, and reflective surfaces, by plant layering, and by the addition of supplementary heat. But the primary mechanism is thermal mass. When observing the more subtle elements of temperature regulation in Phoenix, the abundance of thermal mass can easily be overlooked, though it's all around. From the rock wall, stone patio, and terraces, to the water tanks and the vegetation itself (large banana plants hold substantial volumes of water), you are surrounded by thermal mass from the moment



*A hammock, hanging in the subtropical ambience of the greenhouse, is suspended between two stone gabion walls which provide thermal mass as well.*

you enter the greenhouse to the moment you leave.

Thermal mass helps to keep the greenhouse warm on winter nights and cool during summer days. How does this work? As the weather cools with the arrival of fall and winter, the angle of the sun changes and we heavily prune the passionfruit growth on the trellis above Pebble Beach to admit the low light. With the sun lower in the southern sky, light from its rays can reach through the south side of Phoenix during the day and hit the flagstone patio and north gabion wall; these in turn absorb the energy of the sun. Throughout the night, long after the sun has set, these massive stone elements release heat to maintain a stable temperature range in the greenhouse. With the dawn, sun streams in again and begins to reheat the now-cooled walls; the process continues

throughout the winter. Sunlight striking the growing beds also heats the soil, stimulating root growth, and enhancing the warming effects of the climate battery (our underground heat storage engine) as it takes colder air from the top of the greenhouse and pumps it at 10 ft<sup>3</sup>/second through the heated soil and out of the vents strategically located in each of the four main beds.

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## **Thermal mass helps keep the greenhouse warm on winter nights and cool during summer days.**

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During the summer, the pergola above Pebble Beach hangs thick with passion fruit, and the sun sits higher in the sky. Because the angle of the sun is higher, and the patio and gabion wall are now shaded by the plant growth, light and heat no longer reach them as they did in the winter. As a result, these surfaces stay cool, and their cool mass helps to maintain lower temperatures in the greenhouse.

Since water is a great medium for absorbing and releasing heat and energy, Phoenix's two 300-gallon water tanks, painted black on one side and located on the north wall, are perfect for thermal mass. This is where we collect all the water harvested off the roof through the water catchment system, and store it for our drip irrigation system or for easy access to water in the greenhouse. In the winter, we turn the black side to face the sun and maximize the storage and release of BTUs. During the summer months, we may turn the tanks back so that the clear, unpainted side faces the sun. The tanks remain cool during the summer as they are also shaded by the passionfruit vines. During this time, we may also use the tanks to store fish as part of an aquaculture system.

### **Ventilation**

Letting in warmth and pollinators (and keeping out garden pests) is an essential function of any successful greenhouse. This is accomplished on all sides of Phoenix by the venting windows and doors, but the role of these features does not end there. They also provide ventilation, discharging and mixing the hot, stagnant air in which harmful molds and fungi thrive. In this way, the vents enable a greater degree of control over the ambient temperature. All this is accomplished without the use of external energy or artificial ventilation systems.

Above the south growing beds are six 12' x 2' vents. There are also three doors, several windows, and circulation fans on the east, west, and north sides of Phoenix. Finally, there are five

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additional 12'x 2' vents located high up on the north wall. All of these may be opened or closed to control airflow and temperature. This increases or decreases circulation to better regulate the greenhouse climate and improve air exchange.

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**From the rock wall, stone patio, and terraces, to the water tanks and the vegetation itself...you are surrounded by thermal mass from the moment you enter the greenhouse to the moment you leave.**

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### ***Pathways as worm farms***

At first glance, the pathways that wind through the beds of Phoenix simply provide passage and storage space in the greenhouse. What is not immediately apparent is that they also function as an extensive network of independent worm farms. We began growing worms in 15-gallon buckets but soon realized that rather than growing them in isolation and distributing the castings, we could simplify the process by propagating them directly into the growing beds. We began by using the south growing beds. For four to six weeks in the spring and again in the fall, just after we have harvested the summer or winter crops, we can produce worms in these 4'x 4' plots. This worked so well that we decided to expand our worm production into the south pathway. Here, we allow the farms up to three months to digest waste material; they can be harvested four times a year. When they're ready, we distribute the worms amongst other beds, both indoors and out, or put them into buckets for sale.

The worms themselves are highly valued at CRMPI because they serve many functions. They continually improve the soil, allowing the forest garden and greenhouses to produce bigger and better crops. They also provide a source of income and their placement in the greenhouse minimizes the work of transporting castings or soil from other locations around the site. They process our organic waste and turn it into nutrient-rich fertilizer for plants. Finally, worms are great food for the fish and will continue to replenish their own populations rapidly as long as we continue to feed them.

Loading pallets cover the pathways to spread the weight of

gardeners and guests and prevent soil compaction from foot traffic. The pallets also provide space for potted plants while the worms are hard at work beneath them decomposing organic matter, aerating the soil and producing rich, black humus.

### ***The sauna***

Any greenhouse will do a great deal to make a harsh climate more livable. And as we create habitat for plants, we also create it for ourselves. This is one of the "hidden" connections of the indoor garden. There is nothing like having a warm and lush place to retreat to when it's snowing outside. The sauna is especially appreciated by visitors and residents of CRMPI. Five or six people can easily fit into this healing room, which is a place to relax, unwind, and connect with friends and co-workers. We like to place a pot of water on the stove filled with aromatic herbs from the garden: mint, rosemary, or lemongrass work especially well. We pour this herbal water over the hot stove, creating a cloud of steam that opens pores and draw out toxins.

The hidden function of the sauna, however, goes far beyond relaxation and healing. In fact, it is working for us, while we relax. Walking into it is like walking into a masonry stove. There



*The pathways in the Phoenix greenhouse function as an extensive network of independent worm farms, in addition to providing storage space and passage throughout the greenhouse.*

are five-inch thick walls of concrete, insulated by ten inches of foam and lined with a salvaged veneer of one-inch thick marble, granite, and sandstone. The wood-burning stove is tucked into the southeast corner of the room, and cedar benches line the north and west walls.

The remaining components of the sauna form a small climate battery. In the northwest corner is a fan, with a four-inch pipe beneath it that descends into the ground and forms a tight coil as

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it extends horizontally back to the center of the sauna room. This coil sits on top of four inches of foam to insulate it from ground temperatures, and is covered by three inches of gravel and then two inches of sandstone. The battery begins its work once a fire is started in the stove and the temperature in the sauna begins to rise. The fan in the northwest corner pumps hot air down into the pipe and pushes it through the coil, which then heats the gravel and sandstone in the floor. Warmth from the stove also heats up the walls of the sauna, which can hold this heat for up to 24 hours. The sauna is an extremely important source of thermal mass in addition to being a vital element supporting the human community at CRMPI. When the door is left open, the sauna releases its warmth into the greenhouse throughout the night and into the following day. When the temperatures outside threaten to fall too low for an extended period of time, the sauna provides Phoenix with the boost it needs to keep its temperature above 40°F. By building the sauna to share the north wall of Phoenix, we saved on building expenses, and enjoy its benefits without having to leave the greenhouse or infringe upon space for plants.

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### **The human connection**

Many of Phoenix's finest features are designed to serve dual purposes. They support the greenhouse microclimate as well as the enjoyment and relaxation of those who visit and live at CRMPI. In addition to the sauna and the hammock, there is Pebble Beach (a place to sit and observe the ever-changing indoor food forest). There is also a small raised platform, where one may nap peacefully amidst banana leaves and passionfruit while enjoying the intoxicating scent of the night blooming jasmine. In fact, the myriad scented plants in Phoenix (jasmine, passionfruit, sweet alyssum, basil, and geraniums, to name a few) are more than just relaxing; they are necessary elements to any successful integrated pest management system. These fragrant plants offer nectar to feed many beneficial insects. The passionfruit vine—which is now spilling over its pergola, heavy with fruit and flowers—also provides shade, cooling the area beneath it and creating a microclimate for shade-loving plants. Shade is also provided by the sleeping platform, and by the vegetative overstory, especially the tall bananas and papayas. Shade in the greenhouse helps hold moisture in the soil, an important design features for dry climates such as ours.

In the bigger picture of the systems at work at CRMPI, the

greenhouses—especially Phoenix, being the largest of four—add a vitally important element of season extension to the whole system. Thanks to the greenhouses, we grow food throughout the year. The greenhouses also drastically increase biodiversity. At 7,200 feet, Jerome Osentowski, founder of CRMPI and master permaculturist, says, “There is more going on in this half-acre (botanically) than on the entire Front Range.”

Also largely hidden, but reaching out from this high-altitude garden oasis are threads of connection to hundreds of student graduates of the permaculture course who are now working across the mountain West, the US, and abroad.

In the even bigger picture of the permaculture community, CRMPI is one of the most sought-after places for people to learn permaculture hands-on. The environment here is harsh, and plant growth in the native woodland is sparse. Despite this, the gardens flourish. If you learn it here, you can probably practice it anywhere. And many have done just that. As CRMPI moves into its second quarter century, it goes forward with an experimental spirit about what is possible, grounded in years of hands-on experience and practice.

The Central Rocky Mountain Permaculture Institute celebrates its 25th anniversary this year. It is one of the longest running centers for education about and implementation of permaculture in the United States. This is evident on-site in the mature forest garden, the greenhouses, and the vibrant community of humans and plants that cycle in and out of the center. It is also evident in the connections between CRMPI and the many who have trained here, and who are growing their own communities and permaculture sites around the US and beyond. Over the years, CRMPI has been a key player in the permaculture community, providing seeds of inspiration and education to many. In this way, CRMPI continues to function as a pioneer plant in the larger ecosystem of the permaculture community. △

*Jerome Osentowski is the founder of the Central Rocky Mountain Permaculture Institute. He has been running CRMPI for the past 25 years. He regularly teaches Forest Garden, Greenhouse, and Medicinal Herb workshops, and will co-teach at the annual Permaculture Design Course starting this August. Parts of this article were excerpted from an upcoming book on high-altitude greenhouse design. Jerome was supported in writing this article by CRMPI's current staff of interns, Evan Granito, Elena Zubalake, and Sara DeAloia.*



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***Don't Lay it on Too Thick—***

# **Managing Manure to Save Mankind**

Gene Logsdon

**A**T A WEDDING PARTY RECENTLY I was talking to some Very Nice People, the kind who, as my father would have worded it, “wouldn’t say ‘shit’ with a mouthful.” We were talking about gardening, a subject dear to the hearts of Very Nice People. The lady next to me, exhuming the airs of high culture, warmed up considerably while discussing roses and carnations, and mums. I could tell that I had met with her approval. Then I mentioned that I had just finished mulching part of my garden with manure. Her raised glass stopped in midair on its way to her suddenly very pursed lips. She stared at me. “You covered your garden with...manure?”

“Yep. I try to get on about a 4-inch layer every year in July.”

“With manure?” she repeated, her dismay turning to horror.

“Oh my.” That was the end of the conversation. I might as well have told her that I put a layer of radioactive dust on my garden.

If our civilization has sunk into such a state of paranoia that even intelligent and educated people equate manure with disease, death, and destruction, it is high time to rise up and scream, “Holy shit!”

If you have gotten this far reading without becoming overwhelmed with nausea at so much attention given to manure, I hope that you are convinced that barn manure, especially barn manure dried and aged for a few months, makes as safe and beneficial a garden mulch as any compost you can put on it. You will also know by now, if you didn’t before, that aged barn manure is rich in almost all the nutrients that garden plants need. In fact, bedding manure laid on as a mulch 4 to 6 inches deep is heavy enough to blot out weeds effectively. It is especially effective against chickweed and purslane. Both are more apt to crawl along the soil surface than try to grow strongly upward like a sow thistle or pigweed does, so blunting their upward mobility is fairly easy with heavy mulch. Laid on in July, the manure will keep the garden more or less free of these weeds and others like them into the next spring planting season. It takes that long for the bedding manure to decompose enough so that weeds can grow up through it. Without such mulch, chickweed, even when kept under control by tilling or hoeing in summer, will rally and grow in late fall and then spread with a vengeance in spring, before the soil is dry enough to cultivate.

However, if manure is laid on too heavily, too much of it will remain the following spring, preventing the ground from warming up. Every climate will vary a little depending on moisture and winter severity, and you’ll need several years of experience to know precisely how thick to apply the mulch.

The manure mulch won’t stop all the weeds, mind you. Right around the base of the vegetables there is always space for weeds to find sunlight and grow. And in August there will always be a few weeds that push up through the mulch no matter what. But these are easy enough to pull out by hand or cut off through the mulch with a hoe.

On salad plants that we eat directly, like lettuce, I don’t put even the safest manure up close to the plants; I use grass clip-

pings there instead. And in no case should you use fresh manure drippy with urine close to any plants. The ammonia will burn the lower leaves. The plants almost always recover, but why put them through the ordeal?

Another great value of manure mulch is its use as a moisture preserver. Such mulch is equivalent to at least half a dozen irrigations in a dry year. If soil has had good rains up into June, it will do fine without any rain in July under any heavy mulch.

There are other ways to mulch with manure. My sister Berny and brother-in-law Brad cover their garden in late fall with about a 3-inch layer of composted horse and sheep manure and rotary-till it into the soil just a little. They do this after cleaning up the residue of spent plant growth, and they mulch again the next summer with straw or other organic material. Their soil is so rich that you must be careful not to stand in one place too long. You might take root.

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I put up a 4-foot-square, concrete-block compost bin next to our gardens. I didn’t use mortar. The first layer of blocks is set into the soil about 6 inches, and the rest of the blocks are laid up to about 4 feet in height. The blocks haven’t shifted very much over the years, and when they do a little, they’re easy to reset. Also, because I left the blocks unmortared, I can take down the wall on one side when I want to shovel out the finished compost.

I layer grass clippings, leaves, and a little soil with alternate layers of more or less fresh sheep manure that in March is on top of the manure pack. The compost heats up dramatically, and as decomposition progresses, it settles nearly 2 feet. Then I add more layers of manure and leaves and grass clippings. A third addition is necessary to keep the hotbox, as I call it, full to the top, but usually I want the level of compost to be about 6 inches from the top so that I can set plants on top of the warm bed and have

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enough clearance to put a covering of plastic roofing over the bin during the first week or so of growth, when the air temperature is still liable to be quite cool.

The first heat generated by the compost is warm enough to cook a ham in aluminum foil, as skilled composters have shown for a stunt. In the second heat-up, after the addition of more manure and other compostable materials, or after the compost has been turned, the temperature does not rise quite so much, but it's still enough to kill any parasite eggs (like roundworm) that might remain. To take advantage of the heat, I set vegetables that we have started in the house in pots on the surface of the warm bed. The plants sit low enough that they fit under the plastic roofing

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panels until the panels are no longer needed to keep out the early spring cold. This is a very tricky operation. The ammonia escaping from the hot compost can injure or outright kill the plants, so it is better to wait until the first big heating period has passed to set plants on top, or even to germinate seeds in the compost, just as market gardeners of the past learned to do. The second heating won't usually cook the seedlings. But you may need to do a little trial and error under your own conditions. To be safe I usually sprout the seeds in the house and then move them to the hotbed.

I don't use the plastic cover except when absolutely necessary. Even on a cool day, the sun coming through the cover can produce excessive heat. It is better to invest in one of those sashes that open and close automatically in response to the sunlight. I have not done so only because I don't want to spend the money. Be careful at night not to close the sash down all the way, so that ammonia can escape without harming the plants.

I keep wondering, nevertheless, if I am taking as much advantage of this free heat as I should. Red Cat Farm in Germansville, Pennsylvania, is testing an idea to use that heat in one of its greenhouses, according to the Pennsylvania Association for Sustainable Agriculture. Three feet of active compost, horse manure, and bedding mixed with wood shavings or sawdust is put into cinder-block bunkers along the side of the greenhouse. Flats of seedlings are sprouted over the bunkers. The heat also helps warm the whole greenhouse, of course.

I don't turn the compost in the bin to aerate it like most composters do. That means that I lose some of the fertilizer value of the manure in the escaping ammonia. But by now that loss is not problematic because our garden soil is so rich already that I don't need manure of the highest nutrient value. Nor do I need to make "instant" compost, as I call the result of all those methods that gardeners are instructed to use when they are in a hurry to make

compost fast. I am not going to use my manure compost on the garden until the following year. After the compost quits heating and after I am through growing bedding plants on top of it, I add handfuls of earthworms, which quickly burrow into it. Then I fill the bin to the top with more compostable materials and let it set until the next spring. By then, between aging and heating, this compost is about as free of any possible disease pathogens or parasite eggs as it is possible to achieve in our imperfect world. In early spring, before I do another batch of compost, I take down one wall part way and shovel out the finished compost into a pile right next to the bin. I use it as necessary in the garden until it is gone. A shovelful or two goes into the ground with every seed potato and melon seed, and with every tomato, pepper, sweet potato, and eggplant I set out. In spring when the soil is still on the cool and wet side, it is most beneficial to insert both seeds and plants into a bit of hole filled with warm, dry, black compost. I put the compost around rhubarb plants just starting to send up new growth too. If any compost is left, it goes on the asparagus, although I usually add aged manure directly from the barn on the asparagus bed after their season has passed.

Another way to use fresher manure from the top of the manure pack is as mulch around orchard and ornamental trees. The ammonia in the manure, and especially in the urine, will not wilt the trees like it might vegetable plants. The manure not only fertilizes the trees but smothers weeds around the trunks. The mulch should extend out about as far as the branches extend on a young tree. With the mulch keeping the weeds smothered out, you will not be tempted to run your lawnmower too close and scrape the tree bark. You also will not be tempted to spray weed killer around the trunk. Doing so over a period of years can cause injury to the tree that doesn't show up right away.

In the garden, the manure mulch will have mostly decomposed by spring, and what's left can easily be incorporated into the soil with tiller or disk. That light mulch might indeed delay cultivation a few days, but that is usually a good thing. Often gardeners are tempted to rotary-till and plant when the soil is still a tad too cold. Nothing much is gained by such early planting. If the soil under the remaining spring mulch is dry enough to till, you can be assured that it has also warmed up enough for planting. △

*This excerpt is from Holy Shit: Managing Manure to Save Mankind by Gene Logsdon (Chelsea Green Publishing, 2011).*

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# Foods from the Wilds of the City

Rachel Kaplan

*When you reap the harvest of your land, you shall not reap all the way to the edges of your field, or gather the gleanings of your harvest. You shall not pick your vineyards bare, or gather the fallen fruit of your vineyard; you shall leave them for the poor and the stranger. —Leviticus 19:9–10*

**I**N MY SMALL CITY, the fruit literally falls off the trees and onto the streets. Some people harvest their backyard trees, but many people let the fruit fall and rot. I'm hanging over the fences at times, longing for that last tasty fig that is destined for the ground. Fortunately, the age-old tasks of gleaning await us. All you need is a basket, a fruit picker, permission, and a little bit of time. If you happen upon a tree that is not obviously on anyone's property, it's fair game for picking. This kind of gleaning can be one of the pleasures of city living.

Foraging is an ancient, beautiful practice that traditionally supplied a portion of people's food needs over different seasons of the year. Foraging fell into disfavor in the last century through our reliance on processed foods, but was once the revered province of shamans, natural healers, and rural folks of all stripes. Herbs, medicines, tasty greens, root crops, and fruits in season are part of the forager's grocery. We reclaim the pleasure of the hunt, and pick up our forager's sticks once again. No more will we ignore this fine excuse for a productive walk in our neighborhoods. Foraging and gleaning are ways to eat local, save money, and practice our resourceful relation to place.

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### Gleaning

By far, the most reliable source of food in the city's gleaning web are those fruit trees standing in front of people's houses waiting for someone—you—to pick them. Don't delay. Walk up to that house and knock on the door. Ask your neighbors if you can harvest their fruit. Sometimes people who don't tend their trees are happy to share some of the excess, especially if you are willing to pick as much as you can and leave some in baskets on their front porch. Our fruit foraging practice yields hundreds of pounds

of fruit for our family each year, an excellent return on the time we spend wandering the streets and picking it up.

Petaluma Bounty, a northern California non-profit dedicated to food security for all citizens, runs a program called the Bounty Hunters. After identifying trees whose fruit is going to waste, the organization makes relationships with the owners of the trees, and then heads out to pick up the extra produce. It's then given to local residents or sold at a low fee at the community farm that was established to serve food-insecure folks in the area. The Bounty Hunters picked three tons of food in their first year. In year two, four tons of food, which otherwise would have gone to waste and rotted on people's lawns, was foraged and distributed to people who need it. This program resourcefully uses the bounty around us to strengthen our community. You can start a project like this in your neighborhood, too. (Check out [www.petalumabounty.org](http://www.petalumabounty.org) for more inspiration.)

### **The Dumpster: the last American commons**

In 1988, the Supreme Court, that great bastion of freedom for all, declared that once something is thrown away in a Dumpster, it becomes common property, thus establishing the Dumpster as possibly the last and largest commons in the US. Most people think eating or foraging out of a Dumpster is nasty, but when you really get in there, you'd be amazed at how much perfectly fine food, good books, clean clothing, furniture, and kitchenware the Dumpster holds. "Freegans"—folks who live an anti-consumerist lifestyle of alternative strategies based on "limited participation in the conventional economy and minimal consumption of resources"—often Dumpster dive for dinner.

Freegans "embrace community, generosity, social concern, freedom, cooperation, and sharing in opposition to a society based on materialism, moral apathy, competition, conformity, and greed." The lifestyle involves salvaging discarded, unspoiled food from supermarket Dumpsters. Freegans salvage the food for political reasons, rather than out of need. "These people don't eat out of Dumpsters because they're poor and desperate. They do it to prove a political point. You wouldn't expect someone to choose a lifestyle that involved eating out of Dumpsters. Kind of seems like something you do as a desperate last resort, but there's an entire society of people who willingly get their meals out of the garbage," MSNBC correspondent Tucker Carlson reported.

Most of us won't go the hard-core route of the freegans, but a moderate approach to the riches abandoned in a Dumpster never hurt anyone. Dumpster diving is a truly conservative approach to resource use. The ultimate reuse action, it can feed you and your farm animals quite well, while saving massive amounts of perfectly good stuff from going right into the landfill. While people may look at you askance with your feet in the air and your head in the Dumpster, you are also bound to make some friends Dumpster diving. And you'll definitely eat for less, and decorate your house for less, too.

## Mapping the city wilds

Using fruit as their lens, the artists' collective Fallen Fruit "investigates urban space, ideas of neighborhood and new forms of located citizenship and community. From protests to proposals for new urban green spaces, we aim to reconfigure the relation between those who have resources and those who do not, to examine the nature of and in the city, and to investigate new, shared forms of land use and property... We consider fruit to be

## In 1988, the Supreme Court...declared that once something is thrown away in a Dumpster, it becomes common property...

many things: a subject, an object, and a symbol... everyone has a fruit story linked to place and family, and many echo a sense of connection with something very primal. One word for this thing could be sweetness."

Creating maps of public fruit—the fruit trees growing on or over public property—was this group's first action. Their interests have expanded from mapping public fruit to sponsoring public jamming events to nocturnal fruit forages. They also do community tree plantings on the margins of private property and in community gardens, and neighborhood infusions, where citizen take the fruit found on a street and infuse it in alcohol to capture the spirit of the place.

### Foraging for wild food in the city

City landscapes often provide botanical diversity that makes foraging for the city's weeds and wilds a tasty treat. Some city landscapes are more bio-diverse than a forest or a meadow. Urban and suburban environments, while providing a wide variety for foragers, also provide a number of challenges. One of them is the liberal use of pesticides on many people's properties, which you definitely don't want to be eating. The other limitation is, of course, private property. It's best not to take food from someone else's tree—or garden—without permission. Beyond the problems of poison and property, foraging for wild foods has a couple of common sense rules.

- Know what part of a plant is edible, and don't experiment with the other parts.
- When you've positively identified a plant, be cautious. Take small bites at first to make sure

you have no negative reaction to it.

- Plants that grow close to busy roadsides are best avoided—they're toxic.
- Eat wild foods only in season. They taste better.
- Just because something is a "weed" doesn't mean it can't hurt you. Conversely, just because it's a "weed" doesn't mean it isn't great to eat. Don't eat anything unless you know what it is and what its effects are.

When foraging, a basket, pruning shears, plastic bags, and a fruit picker may come in handy. You'll also need the more intangible skill of plant identification. An awareness of where you walk and what you might find are also important. Having a broad palate is also helpful—if you're willing to try different things, you'll have more food for dinner. An awareness of the seasons and when certain plants are likely to be found is also useful. This is a most essential and beautiful skill to cultivate however you choose to practice it.

Below are a select few wild "weeds" common throughout North America that may be available in your city or town. A list of local available edibles—with names and identifying characteristics—will be your best source of information for foraging in your locale. △

*An excerpt from Urban Homesteading: Heirloom Skills for Sustainable Living by Rachel Kaplan with K. Ruby Bloom, ©2011 Skyhorse Publishing. Reprinted with permission.*

Common name	Botanical Name	Edible Part
Alfalfa	<i>Medicago sativa</i>	Leaf, flowering tops, seeds
Blackberry, raspberry	<i>Rubus spp.</i>	Fruits, leaves
Burdock	<i>Arctium lappa</i>	Root
Calendula	<i>Calendula officinalis</i>	Flowers
Chickweed	<i>Stellaria media</i>	Leaf
Chicory	<i>Cichorium intybus</i>	Leaf, buds, roots
Chrysanthemum	<i>Chrysanthemum leucanthemum</i>	Leaf
Cleavers	<i>Galium aparine</i>	Leaf
Dandelion	<i>Taraxacum officinale</i>	Leaf, roots, flower
Dock, sorrel	<i>Rumex spp</i>	Leaf, stem
Lambsquarters	<i>Chenopodium album</i>	Leaf
Lemon balm	<i>Melissa officinalis</i>	Leaf, flowering tops
Lettuce, wild	<i>Lactuca scariola</i>	Leaf
Mallow, cheeseweed	<i>Malva spp, M. crispa</i>	Flowers, fruit, young roots, leaf
Miner's lettuce	<i>Montia sp</i>	Leaf
Mint	<i>Mentha spp</i>	Leaf
Mustard, wild	<i>Brassica spp</i>	Leaf, flower, seed
Nasturtium	<i>Tropaeolum majus</i>	Seed, flower
Pigweed, amaranth	<i>Amaranthus spp</i>	Leaf, stems, seed
Plantain	<i>Plantago spp</i>	Leaf, seed
Purslane	<i>Portulaca oleracea</i>	Leaf
Queen Anne's lace	<i>Daucus carota</i>	Leaf, flower, root
Shepherd's purse	<i>Capsella-bursa-pastoris</i>	Leaf, roots, seed
Sorrel, sheep	<i>Rumex acetosella</i>	Leaf
Stinging nettle	<i>Urtica dioica</i>	Leaf (cooked)

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# The Love, Lore, and Mystique of Mushrooms

## Fungus Cultivation Tips

Greg Marley

**T**ODAY MANY CALL THE INTEGRATION of mushrooms into the home and garden landscape permaculture gardening and recognize it as one vital component of creating an intentional sustainable ecosystem in a home or commercial setting. The thoughtful use of saprobic fungi assists in the breakdown and recycling of plant mulches to release nutrients for the growing crops. The fruiting mushrooms are another crop to be used as food. There is an increasing interest in growing our own food, and mushrooms are a logical addition to tomatoes, squash, and beans. Some kinds of mushrooms are easily grown on the average suburban house lot. Just as the vegetable gardener helps to ensure success by learning the techniques for how plants grow best, the mushroom gardener is in need of basic knowledge about the life cycle and growing needs of his or her fungal target species before setting forth outdoors. So, before you run out to buy a new sauté pan for cooking your homegrown mushrooms, there are a few basic cultivation tips to consider. These include:

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### We live with the mystery of mushrooms appearing fully developed in our lawns and gardens, seemingly overnight.

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1. Develop a working understanding of the life cycle and growing needs of mushrooms in general and the specific needs of the mushroom you want to grow; this is vital to the success of the enterprise.

2. Explore your property with an eye to evaluating the overall environment where you live and the microclimates created by tree cover, slopes, and the shading of buildings. Learn what you can modify easily (and cheaply) to make the site more mushroom friendly.

3. Investigate potential organic food sources for your hungry fungi; what is easily available, inexpensive, and in need of being recycled?

4. Ensure access to water.

5. Cultivate a patient attitude and be comfortable with failure in the pursuit of knowledge.

#### 1. Understand the mushroom life cycle.

A mushroom is the fruiting body of a fungus, one large enough to be seen easily with the naked eye. Mushrooms take on many forms; the round-domed cap, complete with an intricate radiating set of gills attached to a central stalk growing on the

ground is what most people hold as the classic form. The mushroom is analogous to an apple or tomato or any other fruit from a plant. The reason for its existence is to make, display, and distribute the spores of the next generation. And, just like an apple hanging from its tree in the orchard, a mushroom is a very small portion of the whole fungal body. Where the entire apple vegetative body (tree) is composed of the roots, branches, twigs, fruit, and leaves, the fungus also has a vegetative body, the mycelium. It generally is not visible, so it would be easy to believe that the visible mushroom is the entire organism. This is not the case. For this discussion, I am focusing specifically on the saprobic fungi that live by decomposition of organic matter rather than the mycorrhizal species discussed in the previous chapter. Let's look at the oyster mushroom as an example.

The classic oyster mushroom presentation of multiple fleshy caps fruiting on that old sugar maple in late October is the end result of a great deal of life work by *Pleurotus ostreatus*. The current generation of mushrooms began when a spore, the microscopic "seed" of *P. ostreatus*, was released from the parent mushroom and landed in a wound on the maple tree trunk, found the proper amount of moisture and warmth, and germinated. The germinating spore developed into a microscopic thread of hyphae that grew and branched to form the vegetative body of the fungus. Most people know hyphae as the cotton-like fuzz they find on bread wrapped in plastic left too long in their breadboxes. These one-cell-wide hyphal threads grow through the substrate, colonizing the heartwood of the sugar maple, and, as they elongate, they produce enzymes that break down the wood of the tree. These very powerful enzymes flow out of the cell and into the surrounding environment where they do the work of breaking down the complex carbohydrates, such as cellulose and lignin, into simple sugars. These carbohydrates are then brought back into the hyphae as food. The fungus can be said to literally eat its way through its host with the heartwood being the main course.

As the hyphae grow through the maple heartwood (in the case of the oyster mushroom), they are colonizing it. The network of hyphae formed in this process is known as mycelium. The mycelium functions to support the growing fungus through storage of nutrients and water, transport of nutrients and, as the conditions are right, to carry out the formation of the mushroom fruiting body. Before this can happen, fungal sex must occur. This fleeting moment happens when the haploid hyphae originating from one spore meets and combines with the hyphae of another compatible strain of the same species. This doubles the genetic material in the cell and, afterward, the fungus is capable of forming a sexual fruiting body, the mushroom. The combined (diploid) mycelium continues to grow as it colonizes its food source and when the fungus has gained enough food energy (biomass) and the environmental conditions of temperature, moisture, and light (yes, some fungi require specific levels of light to fruit) are conducive, the mycelia will begin to form thick hyphal knots, the precursors to the actual mushroom.

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The oyster mushroom does require low levels of light to set fruit, as my mushroom farming partner and I found out. When our bags of sawdust and straw were left too long in near darkness while the fungus colonized the substrate, they started to set fruit. In the absence of adequate light, the mushrooms produced were spindly, almost all stalk with very tiny caps. Consider the adaptive reason for this. If the mycelium that colonized the maple heartwood produced a mushroom deep in an enclosed cavity in the log, one that had no access to the outside air, the resulting spores would never be launched into the wind for dispersal. Therefore, low levels of light signal the mycelium that it is near the open air, but not in direct sunlight. The expanding mushroom will be out in the open, but not in the direct drying sun.

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## The thoughtful use of saprobic fungi assists in the breakdown and recycling of plant mulches to release nutrients for the growing crops.

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We live with the mystery of mushrooms appearing fully developed in our lawns and gardens seemingly overnight. How can it be that they come from nowhere so rapidly? Indeed, there are a number of smaller fragile mushrooms, such as the strikingly beautiful *Coprinus plicatilis*, the parasol inky cap, that appear fully formed on our lawns and paths early in the morning only to dry out and wither in the afternoon sun. This rapid growth is due in part to the fact that, in the mushroom button stage, all the cells of the mature mushroom are already present in a tightly compact state. The high-speed growth happens through water uptake rapidly filling out these compacted cells. Within a very few hours, in some species, the button, which has been forming quietly out of sight for several days, expands into maturity and begins to release its crop of spores into the air. In reality, most fleshy mushrooms require several days to reach maturity and will continue to mature and release spores for a number of days if the weather conditions remain moist. Others can remain active for weeks, and some woody polypores for several months.

What does the permaculture mushroom gardener need to take from this fungus life cycle primer? The mushroom species available for cultivating in our gardens are saprobes, and require a source of dead plant material as a food source. Fungi are somewhat clumsy in the uptake of the nutrients they absorb from the environment around their hyphae, and some of these nutrients become immediately available to the roots of plants growing nearby. Later, as the fungi die, they release even more nutrients back into the environment. The decomposition of plant tissue and recycling of nutrients happens constantly in the organic layers of healthy soil and forms the basis for the fertility of topsoil. Cultivation or encouraging mushrooms to grow in an integrated garden is a process in which the growing fungus releases the

nutrients bound up in dead organic matter and makes them available to your garden plants. This breakdown of organic matter also builds the fertility and structure of the soil. A byproduct of all this soil-building activity is the crop of mushrooms you bought the sauté pan to cook.

### 2. Evaluate your property for cultivation sites.

Mushrooms are made up of 85–90 percent water and their mycelium is equally high in water. They grow best in habitats with consistent moisture, protected from the drying effects of sun and wind. Most suburban and rural yards are a mixture of microhabitats created by variations in sun exposure, soil texture, existing plantings, and moisture content. It is important to choose a site on your property that makes it easy for your mushroom bed or logs to stay damp. Here is a list of considerations:

- The north and east sides of a house are normally the most fungal friendly because they see the least sun.
- An ideal site has partial to full shade and minimal wind exposure. These conditions are best formed by a mix of trees and shrubs forming an overstory canopy and a windscreen.
- For mushrooms growing in wood mulch, compost, or planted directly into soil, it is important that the soil drains. Though moisture is vital, sitting in standing water for any period of time will smother the fungus. If you have heavy, wet, clay soil, consider a raised bed.
- Though a mushroom planting will benefit from protective shade, a mushroom bed among crowded trees and shrubs might find itself robbed of moisture by thirsty roots. This happened to me when I put a bed of garden *Stropharia* along the edge of a dense old lilac clump with two nearby trees. The crowded roots drank up the moisture, leaving my *Stropharia* too dry to grow. Most of the above list is derived from my own trial and error as well as suggestions from a number of general sources.

### 3. Consider sources of food for hungry fungi.

If you want to grow mushrooms in the garden, you need a “substrate,” a usable source of dead plant material to serve as a food source for the growing fungi mycelium. Any experienced gardener knows that applying a thick layer of wood mulch to the garden helps to retain soil moisture by reducing evaporation from the soil surface and also stops weed seeds from germinating. The fresh raw wood also tends to rob nutrients from the soil in

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the short term as the nutrients are utilized by the fungi and slime molds to begin the process of rotting the wood fibers. Over time, the nutrients will become available as the mulch is reduced to soil. Mulch, properly chosen and used in a garden protected from both direct sun and complete inundation by water, can be used as a food source for a number of fungi. Other fungal food sources useful in outdoor home mushroom cultivation might include:

- Stumps of trees, both hardwood or conifer, left in place
- Recently cut lengths of wood (logs)
- Straw, hay, or other agricultural waste
- Shredded cardboard or paper
- Rags made of cotton or other natural fibers (avoid silk)
- Composted leaf piles or composts of mixed yard waste

Look around your yard, neighborhood, and town for any likely source of uncontaminated plant waste and consider its potential to make mushroom mycelium happy and you may have a substrate for home cultivation. Remember, this is an opportunity to reuse or recycle plant waste that, in the past, you may have paid to be carted off to a landfill. Some substrates to avoid include branches or logs that have been dead for more than several months (less time if cut during the warm or dry time of the year). Also avoid composted wood mulch, as it is already colonized by fungi and less likely to be a welcoming home for new species. Also avoid mulch that is made up of only bark. Avoid any paper, cardboard, or plant material that might be contaminated with chemicals or pesticides and definitely avoid any contaminated with fungicides.

#### **4. Ensure that you have access to water.**

There will be times when nature will not deliver the moisture your mushroom crop needs. Ask any farmer or gardener; nature cooperates when it pleases her. Since the single most crucial environmental need for mushroom cultivation is water in adequate amounts delivered at reasonable intervals, a handy source of water and a garden hose are almost essential. The drier and more unpredictable your growing environment is, the more important it will be to have a back-up water source. A sprinkler or spray is generally ideal, though for log cultivation, especially for shiitake mushrooms, the ability to soak your logs in water to trigger fruiting is important. A 30-gallon plastic trash receptacle works very well for a small number of logs.

#### **5. Cultivate patience and active observation.**

We live in an age that tends to encourage the belief that events unfold magically, without effort and planning. Our media images and sound bites are filled with meals instantly appearing out of microwaves, homes being cleaned with a wave of the hand, and children marching directly to bed with clean faces and homework finished while we complete our graduate programs online in our spare time. Mushrooms do not watch TV, and don't have cable or Internet access; they are fickle, earth-based living creatures with specific living requirements and their own internalized clocks. When we cultivate mushrooms, we seek to carefully set up a living situation that will make them happy enough to give us their offspring for dinner. That takes time and requires that we stay aware of the needs of our wards and respond, as needed, to make their lives easy. Just as growing a backyard vegetable

garden requires that we learn the skills and techniques to make the vegetable plants happy, growing mushrooms requires us to build similar skills. The difference is that we have been cultivating plants for many centuries and can peer back on a long line of ancestors whose lives depended on the skills of plant cultivation. We have a complex, established civilization today due, in part, to their success in making plants grow. Man is a beginner at growing mushrooms, and very few of us can rely on the teachings of past generations of relatives to pass on the skills.

The Russians refer to mushroom picking as the quiet hunt. There is no noise of guns, drama of blood, or death throes; it is a time of being at one with the forest. I see growing mushrooms as quiet farming.

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## **...the mushroom gardener needs basic knowledge about the life cycle and growing requirements of fungal target species before setting forth outdoors.**

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Cultivating mushrooms requires that you learn about the growing needs of fungi and how to create a suitable environment. Then it requires that you monitor your crop as it develops in order to continue to supply those needs over time. At the very least, and in ideal conditions, it takes three to four months in a temperate climate for the first crop of mushrooms to appear. Commonly, you will wait six months or even a full year before you see your first mushroom from a log or bed you planted the previous spring. Just as a tomato patch needs soil preparation, seed planting, watering, weeding, thinning, pinching off leaders, staking, weeding, watering, fertilizing, and vigilant watchfulness for pests, so will a mushroom patch benefit from regular care and feeding. As the mycelium of the fungus is colonizing the sawdust, log, or compost as it grows, it is not nearly as visible and encouraging as watching the tomato vines grow larger and bushier, flower, and develop green fruit. Fungi grow out of sight, hidden beneath the bark of the log or under the covering top layer of straw, soil, or wood chips. There is little visible sign or encouragement before, magically, just like TV, the developing mushrooms appear on the surface and almost leap into your basket. The quiet farming is the long interval between bed preparation and planting and the eventual sign of fruit. It is during this interval that active patience is most needed to ensure that the fungi maintain moisture. Look for signs of drying by poking beneath the top layers in a mushroom bed or observing signs of checking on the cut end of a log in which the fungus is growing. △

*This excerpt is from Chanterelle Dreams, Amanita Nightmares: The Love, Lore, and Mystique of Mushrooms by Greg Marley (Chelsea Green Publishing, 2010). [www.chelseagreen.com](http://www.chelseagreen.com).*

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# From the Regions

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## *Permaculture in El Salvador*

### The New Revolution

Alison Victoria Shephard

THE SMALL CENTRAL AMERICAN COUNTRY of El Salvador has battled through hundreds of years of rape of the land. Five hundred years ago saw the beginning of the processes of large-scale agriculture and monocropping with indigo and coffee contaminating the earth and water supplies with chemical fertilizers, herbicides, and pesticides as “traditional” agriculture became established. Then in 1980 a civil war broke out that saw the countryside bombed and the economy further weakened, leaving subsistence farmers unable to tend to their plots of land. The war ended in 1992, and conventional agriculture was reestablished once more. Throughout this whole time, slash-and-burn farming methods preferred by agriculturalists razed the ground, soil fertility was dire, rivers were polluted, and deforestation was rife, making soil erosion during the torrential rainy season a huge problem for farmers. Small-scale subsistence farmers were ignored by the government and had chemical products constantly championed as a way to revolutionize farming. The result has been the slow poisoning of farmers, their families, and their communities.

as a sustainable alternative to conventional, harmful methods of



*A farmers market in Cacaopera gives the people new opportunities.*

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**“I see it as a different kind of revolution, one that achieves just what we were fighting for during the civil war—a dignified life for our people, healthy food and an education.”**

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During the civil war, Juan Rojas found himself in Australia as a refugee, and it was here that the Salvadoran encountered permaculture. After the war ended and Juan returned to El Salvador, he united with a group of subsistence farmers and taught what he had learned. In 2002 this group became the Permaculture Institute of El Salvador (IPES), a non-profit organization that continues to work throughout rural El Salvador to promote permaculture

cultivation. Permaculture is offered not only as a solution to improve food production, soil quality, and water supplies, but also as a form of community building; supporting the evolution of a grassroots farmers’ movement that has been blossoming across the country since the Institute’s inception—largely thanks to its unique adoption of the Mesoamerican farmer-to-farmer methodology.

This method ensures that knowledge spreads as effectively as possible, with farmers in control of their own learning, as students become teachers. Elected community leaders are chosen to represent their area in the internationally-recognized permaculture design course offered by IPES. The course is free for these community leaders and takes place over a year, so that farmers can continue to tend to their personal plots of land throughout the course. These students then pass on what they have learned to interested farming families in their respective communities; thus fostering a decentralized spread of education. As well as the sharing of knowledge, seed-sharing is encouraged to avoid having to purchase new ones every year, and to ensure a wide variety of crops including those previously lost.

The people involved in the institute insist that it is not a “project” but rather an educational tool and a way of living. Speaking

to these people—permaculture promoters, members of connected ecological networks, farmers in the communities who now use permaculture on their home plots—you can feel their passion about protecting their Mother Earth and about how permaculture has transformed their lives. Agostin, an ex-guerrilla involved with IPES says of permaculture: “I see it as a different kind of revolution, one that achieves just what we were fighting for during the civil war—a dignified life for our people, healthy food, and an education.”

Families are healthier due to a lack of chemicals and a wider variety, higher quantity, and better quality of edible crops produced; they save around £323 (about \$467) a year on agricultural chemicals, decreasing their debt and their need to sell crops at low prices to pay off their debts. Instead they learn to make natural pesticides, herbicides, and fertilizers using natural resources they already have (such as manure, ground and toasted egg-shells, organic compost, etc); thus reducing waste and recycling it into something useful. Furthermore, they are able to raise additional income by selling surplus crops to other communities, or by participating in local farmers’ markets that have been set up via the cooperation of the Permaculture Institute and regional ecological networks.

In a country affected by climate change and susceptible to natural disasters such as earthquakes, volcanic eruptions, and annual tropical storms that bring about flooding, landslides, and extreme soil erosion and crop destruction; protecting agriculture—a livelihood for the majority of the country’s rural inhabitants—is extremely important. Permaculture offers a viable alternative to “traditional” farming methods that can prevent some of the damages caused by such disasters.

In El Salvador, permaculture takes the form of traditional indigenous knowledge about farming that has been all but lost due to the spread of “conventional” agriculture in the name of “prog-

ress.” These methods—such as planting according to the cycles of the moon—are combined with new technological knowledge creating a fusion of the best of both the ancient and the modern world. “One of the beautiful things about permaculture is the acknowledgement of different cultures. Our origins are Mayan

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**“Permaculture has helped us so much because we are now educating ourselves to take care of nature as we are all interrelated with Mother Earth...”**

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and there’s a lot of wisdom to do with the spirituality of Mother Earth” relates permaculture promoter Regino.

In 2009 El Salvador elected its first left-wing government, a party comprising former guerrillas of the previous civil war—many of whom came from subsistence farming families themselves. Since then the government has finally turned its attention to sustainable family farming. This is a window of opportunity for the thousands of families who rely upon small-scale agriculture to survive, and IPES is helping to support a nationwide movement not only to secure recognition and development for these long-ignored citizens, but also to ensure that the country’s

agriculture can progress in a way that will not cause any further harm to the already bruised and battered earth. Permaculture promoter Angélica explains: “Permaculture has helped us so much because we are now educating ourselves to take care of nature as we are all interrelated with Mother Earth... we see that people are now trying to take care of resources here.”

For more information about the Permaculture Institute of El Salvador (IPES) please see their website: [www.permacultura.com.sv](http://www.permacultura.com.sv) available in both Spanish and English. △

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*Students at a permaculture design course getting “dirt time.”*

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# Movement Musings

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*Reflections on Cultural Change*

## Aesthetics: Looking Past the Façade

Jami Scholl

**A**ESTHETICS TOUCHES OUR SENSES, each one of the five. The visual sense usually makes the greatest impact when we first encounter a new place, or a place newly imagined or redesigned. Yet aesthetics works in ways unseen, moving us through the feeling realm by expressing cultural values we may hold or reject very deeply. These feelings, stimulated by aesthetics, often transcend or even defy reason.

And what is this word “aesthetics”? Dictionary entries include the recurring words beauty, emotion, and sensation as distinct from the purely intellectual. Aesthetics is also a branch of philosophy concerned with beauty and the rules and principles of art. It enjoys a long history in philosophy, originating among the Greeks. Yet the topic is not usually addressed in the permaculture design process, even though the failure to do so may cause consternation and conflict with neighbors and public officials. Perhaps we should look to the philosopher Kant’s definition of aesthetics: “the science which treats of the conditions of sensuous perception.”

Art is a defining element of culture, desired but often not practiced. Since permaculture design partakes of art as well as science, aesthetics must be recognized and discussed



*Andreas Citroen's garden at Jardin Bleu.*

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**When traveling to Paris last year, I learned that parks there are referred to as gardens and are treated as places of beauty regardless of the types of plants grown.**

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seriously in all our efforts to create a permanent culture. When I was earning my permaculture certificate, we were told by the instructors that “everything gardens.” Apparently, unlike other creatures, humans garden with intent. This may include artistic, spiritual, or religious expression as well as the more prosaic purposes of providing food, fiber, and medicine. So our gardens, and by extension our farms and other systems, must be designed from a well-developed aesthetic sensibility if they are to succeed in transforming the culture.

Aesthetics reveal hidden connections, display values not directly spoken. They touch on class, economic status, culture, land tenure, law, customs, ecological learning, spirituality, the psychology of flow, and artistic expression, among other things. Aesthetics are often the inscrutable face of deeply held social and historical values, and in this time of epochal change may both pose obstacles and provide opportunities to move the cultural anchors before we are swamped by the storms of economic and ecological upheaval. This is nowhere more apparent than in regard to urban agriculture: farming and gardening our cities.

### ***Changing perceptions of agriculture***

Municipal codes reflect views of agriculture that are dated and not applicable to the issues we face as climate change and peak oil begin to manifest in noticeable ways. Neighborhood developments or homeowners associations frequently impose restrictions that are unfriendly to farming and gardening, implicitly viewing these activities as dirty and déclassé. While we need to confront these misplaced assumptions and cultural prejudices directly, we can also finesse them by our choice of landscaping elements. Edible plantings can be a source of beauty as well as of food.

Homeowners can make perennial plantings of fruit trees, brambles, and other edibles as a form of landscaping. For example, a well-placed and well-chosen cherry tree guild with tidy edging and clean lines around the companion plants can easily be viewed by neighbors as a positive focal point in a front yard. It can offer visual interest throughout the year, reflect layering and

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levels of scale in the choice of large and small plants, and can bring both color and wildlife into play.

Although, in essence, this is a form of agriculture, by employing aesthetic design principles, the edible elements necessary to support household health and well-being can be incorporated into neighborhoods that would otherwise be inhospitable to conventional row crops or other signifiers of work, toil, and poverty. A back or side yard kitchen garden can be designed to include an assortment of plants and wildlife habitat within a formal structure that reifies an orderly relation of humans to nature. Conscious care throughout the growing season will keep neighbors content, as a tidy garden or landscape presents a scene of beauty.

### **Aesthetics and land tenure**

Two events in 2009-2010 brought to my attention the need to address land tenure and economic values, particularly in regard to urban agriculture. Fritz Haeg, known for his art installations under the rubric “Edible Estates: Attack on the Front Lawn,” visited my local university campus to give a lecture on his projects. The book based upon his work was inspiring, but it struck me that his lack of concern for the ramifications of his projects after installation was extremely short-sighted. The focus of his energies was on landscape transformation without thought for the longer-term goal of educating the residents to new values, an approach that would more likely lead to changes in both landscape and lifestyle. Haeg would remove grass, but what replaced it became a brown and neglected front yard as the season progressed. This visual image fed many minds with a negative impression of the aesthetic outcome that could be imagined from urban agriculture, a spectre that for some arouses the fear of declining property values and falling socio-economic status. The adage that we should not judge a book by its cover comes to mind, but in the world of real estate, outward appearances often provide an accurate assessment of the care the home has received and the type of neighborhood one could expect to be living in.

The second event I did not attend, though I would have found it interesting to do so. I received notice of a group in Kansas City who were in a legal and political struggle with the city to allow urban agriculture. Their efforts to promote city farming included a widely distributed email that asked everyone to plant row crops in their front yards as a statement of solidarity. After an intense public outcry, the city council eventually permitted urban agriculture.

In both of these examples, the protagonists confront long held cultural perceptions of what should be allowable land use in urban areas. I sent an email to the Kansas City group asking why they proposed to plant row crops. If the land is owner-occupied, then a better use of the space and a longer-term investment would involve planting perennial fruit crops. This would also work within the framework of current land use restrictions. The response I received was that I did not understand the unique political situation in Kansas City. Perhaps I did not, although I think that land

ownership can help to determine what foods to plant. Perennial crops are a natural fit with owner-occupied land because care can be continuous, while public, rented, or sharecropped land is best suited to annual crops. Community orchards are suitable for land in the commons if that tenure can be protected. In neither example above was long-term planning by assessment of land ownership included in the design, nor was aesthetics considered from a longer-term view.

### **Symbols of wealth**

Cultural perceptions and socioeconomics are important factors in design aesthetics. To discuss differences in cultural perception and personal taste is, in this culture, more acceptable than to discuss social status or economics. Often these intertwined topics

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## **Beauty is enticing and invites people to do the right thing.**

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*An Amish kitchen garden at Mary Stutzman's home reflects Amish sensibilities and culture.*

bring monetary wealth to center stage. Those with the means to do so will often gravitate towards the artistic or differing cultural aesthetics for reasons of social status. Social hierarchy is evident in the animal kingdom, e.g. wolves in the wild or the pecking order among domestic chickens, as well as in human societies. But rank in nature is associated with intrinsic qualities—strength, age, genetic vigor, rather than external possessions.

Traditional cultures revere elders and those with a strong moral or spiritual nature. In these often materially poorer societies, the number of things one owns does not in itself confer status, rather wealth carries with it the responsibility to be generous. In American culture, those with more wealth often display it by living in neighborhoods with immaculate expanses of lawn. Here it is not the amount of land that is impressive, but the way it is manicured. And, in the United States, wealth is not always in the hands of those with a higher social status, as gardens or lawn ornaments can attest, although both play a role in defining a person or a family in the social hierarchy.

The cultural perception of a garden here in Indiana usually brings to mind the image of a scaled-down farm in the “back forty” of a suburban lot. Indeed, the straight rows of beans and tomatoes are often a direct echo of an earlier farming experience,

and where they are not, they fall easily into the mechanical aesthetic that shapes so much of the rest of the culture. When traveling in Paris last year, I learned that parks there are referred to as gardens and are treated as places of beauty regardless of the types of plants grown in them. Further travels, near and far, allowed me to see how fruits, vegetables, and herbs could be grown for beauty as well as functionality. Choosing plants for aesthetic qualities in addition to their function can help to create a park-like setting in a public or private space, although I have had numerous people visibly change their stance and facial expression when I mention vegetables rather than flowers in this context.

This spring, I have given numerous presentations, most of them showing a wide variety of Zone 1 kitchen gardens, both international and domestic, through a range of garden styles from the modern to the historic. After one such presentation, I was delighted to overhear a conversation between attendees where one said, “Why don’t we do that here?”

### **Why don’t we do that here?**

Unlike Fritz Haeg, who was trained in architecture, Leah Gauthier is an artist who uses plants in her art. Her projects include Sharecropper, where she works with a small communal group to grow food in New York City. She is extending that project in Bloomington, Indiana. Tending a Difficult Hope is another project in which she takes gardening to the next steps of food preservation and sharing the bounty. Gauthier considers teaching to be part of her personal journey, which she hopes will inspire others to take their own first steps. There is something to be learned from the example of people who create art, yet any of us can learn to use plants as dynamic media, not unlike paint. Food can be used as a tool for visual and sensory communication even before it is consumed.

Plants, unlike paint, are dynamic. They change in a way that paint cannot. Yet each plant also has its own characteristics that do not change, be it leaf shape, color, texture, fruiting, or season of bloom. All of this can also be enhanced or de-emphasized by the changing pattern of sunlight. The land can be a canvas, a changing tableau where beauty accompanies productivity. Imaginative expression may emerge as a Monet painting—all soft colors and suggestive shapes, or take graphic themes where the focus may be on a single color or a color family. Inspiration can be had from many sources, whether a painting, textiles, or perhaps the curves of a sculpture. The medium of plants can be used to inspire and entice one to step into the garden. Once there, the temptation of food to eat begs the visitor to enter more fully into the painting and engage all of the senses. Through interaction, the garden, which first may appear to an outsider as a flattened

canvas, may draw its viewer into a three-dimensional experience where the discovery of interconnections changes that person’s view of the world.

Permaculture strives to create permanent cultures, where humans make gardens of all sorts and for all functions. To achieve that, we must move social consciousness beyond its present dichotomy around land use. Most people today thinking of gardens as beds of flowers planted for decorative effect, while they view the growing of food—if they think of it at all—as done on farms which are irredeemably ugly. Many people may disregard permaculture based solely on aesthetics—a perception that wild or unexpected combinations of plants are chaotic, weedy, unmanaged. This perception, whether or not it is accurate, may shut the door to possibility before someone can enter. If our goal is to change a bit more of the world in a positive direction, then aesthetics must be addressed just as energy flows or any other element in our designs. Mainstream gardening books talk about creating garden rooms, color palettes, designing for formal or informal styles, including focal points, the front yard, developing beds, balancing trees, flowing lines, etc. Native plants have a role to play as they can be nice to look at, serve multiple functions, and reduce the need for mowing a lawn. These elements can be combined as another way to bring permaculture to more people. Gardening fulfills for many people an aesthetic need which we can make productive. Currently, permaculture designed gardens address material needs in a systematic way without recognizing the important role that aesthetics plays in defining culture.



*Art or Garden? An installation by Leah Gauthier*

### **Escaping the ‘ugly is good’ trap**

Let us not be trapped in our own perceptions that aesthetics are unimportant. Just as the forest is our teacher and can rejuvenate the spirit, a beautiful garden may do so as well, particularly

in city environments where wild nature is pressed to the margins. Any assessment of needs should include aesthetic needs. It begins with the client’s preferences and the reasons for them, and then moves from this point of information into the design of the site and the particular plants selected.

The number of permaculturists is very small in relation to the rest of the population. If we want to make an impact on the state of the world, then our numbers must grow significantly. We must make it a priority to attract people from all levels of society, helping them to develop an understanding of how their individual actions affect the entire planet. Beauty is enticing and offers an invitation for people to do the right thing. Beautiful gardens can begin to engage those who may never have shown an interest in growing plants for food, readying them to take the next steps into a sustainable way of life. The search for the beautiful meets a real human need. When it is included in garden design it opens up new possibilities of abundance for both the individual and for communities. △

*Jami Scholl runs My Edible Eden ([www.myedibleeden.com](http://www.myedibleeden.com)) and lives in Bloomington, Indiana.*

# Reviews

## Cassandra's Call Review by Peter Bane

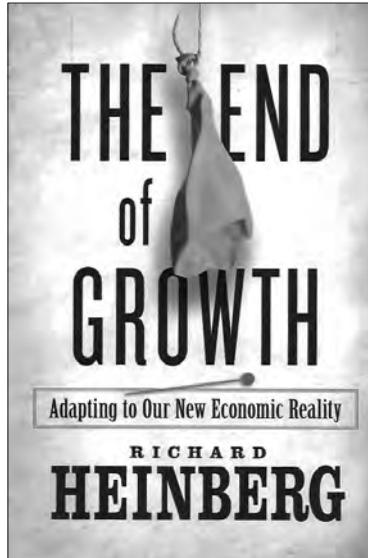
**RICHARD HEINBERG**  
*The End of Growth:  
Adapting to our new  
economic reality*  
New Society Publishers.  
Gabriola Isl. BC. 2011.  
320 pp. paper. \$17.95.

TO BE EAGER TO READ a book that attempts to deliver the last rites to the world as we know it may be a form of perversion, but if so, it's one to which I'm inclined. As I sat down to read through this yummy collection of bad news on the eve of American independence, a lightning bolt struck the transformer across the street and plunged the neighborhood into twilight. Fitting, I thought, on all counts. I slipped on my LED headlamp and sat down in the rocker.

For those of us who've been following the Limits-to-Growth trajectory for a while, there's little new in this book, but there's still plenty of reason to read it. Heinberg is an articulate and engaged writer and he's very well informed. He's been writing books, blogs, and articles for some years on subjects such as oil depletion, coal depletion, and the transformation of agriculture, all the while beating a path from lecture podiums to fundraising summits in an attempt to awaken as many of the world's potential decision makers about the singularity now in our midst. Those subjects are all the real reasons why growth must end, but it turns out that the downside of growth won't be just an amusing rewind of the upside (which wasn't all that great anyway, remember WWII and the bomb?). The end of growth changes everything, and most especially, it changes the economy, politics, and even fundamental aspects of social cohesion irreparably. *The End of Growth* may be as close as we will ever come to having a definitive but still useful announcement that everything has changed. By the time we can be more certain of what has happened and what it all means, there will be little we can do about it. There remain a few precious moments (months, seasons, even

years) for action. Ladies and gentlemen, please put on your life vests. The ship of economic growth is going down.

It remains to be seen what the sinking fortunes of the economy will take with them. Our jobs? Our houses? Our cities? Our democracy, already imperilled? We may have seen the end of growth, but we are certain not to have seen the end of bombast, delusion, and demagoguery. It is as if, having failed to refloat the economy on a \$12 trillion lake of red ink: stimulus, bailouts, guarantees, and sleight-



of-hand, the nabobs in Washington are determined to re-inflate it with hot air. The dangers of the present moment—which are enormous—and what the author calls “the wall” of financial collapse, loom grotesquely between us and any possible future of hope, sanity, regeneration, decency, earth repair, civil society—you fill in the blanks.

No one wants this message. Heinberg is clear about that, and he's even concerned about the risk that shouting fire in this crowded and burning theater may hasten the collapse of confidence that is almost predestined to occur. But shout he does, and very persuasively, in the hopes, I think, of warning anyone not yet convinced of the march of history to get busy battening the hatches.

The book launches into an update of the financial crisis that exploded in September 2008, examining its antecedents and the way it has unfolded. It proceeds to make sense of the nonsense of the massive intervention by governments in a staggered world economy then and

since. And it even puts the ludicrous drama going on in Washington this month (July 2011) between the political parties in a somewhat useful context. Both parties are partly right and absolutely wrong in their stances. The Republicans are right, Heinberg says, to recognize that debt will crush us, and that further government spending cannot fix the problems of the economy. They are completely wrong in their timing and efforts to pull the only plug of life support that is keeping the whole edifice from tumbling into the abyss of economic collapse. How is that for drama? The Democrats are right that money needs to be pumped into the pockets of ordinary people and into massive investments for renewable energy, a transportation makeover, sustainable agriculture, and everything else we will need for a future with much less oil, coal, and gas. And they are completely wrong in imagining that they can preserve Wall Street and the big banks and relaxed attitudes toward war, business, energy, and politics as usual. To put it creatively, as the author has, government has to continue building a bridge to nowhere by spending heavily on remaking infrastructure and keeping people at work or everything will go bust and the streets will erupt, foreclosing more than a few mortgages, but possibly any good options that remain.

Sadly, neither party is ready to face the music or speak truth to voters about the impossibility of repaying the endless trillions of dollars of outstanding I.O.U.s that the economy has racked up over the past 30 years. They will be written off—whether in an orderly way that preserves political stability or in a disorderly manner that does not—they can never be repaid. The inescapable conclusion, and one Heinberg advances, is that we need a new money system to serve us in a new world without growth. Debt-based money, running up interest from its moment of creation, is a great deal of the problem the world faces immediately. Greece can't be successfully bailed out—it should pull out of the eurozone now, and let the French and German banks take the hit. Nor can the U.S. government debt be paid off under present and predictable circumstances. There's no sane reason to default on it, however. The debt could be inflated away, but that would take much more money printing than the Fed has done in the last three years. In fact,

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if the Fed simply bought up the entire \$14.3 trillion dollars of U.S. Govt. debt outstanding, it would merely replace the value lost out of the economy since December 2007. It might not cause one iota of inflation. But don't hold your breath waiting for it to happen. Or the Treasury could simply print money into existence without creating any new debt. It's constitutionally empowered to do so. So the whole charade about a debt ceiling is actually a conspiracy of the parties to continue lying to the public in service to the banksters.

One other possible solution, which Heinberg admits is also unlikely to be adopted, is a universal "haircut" for debtors and asset holders alike. Exempt the first \$25,000 of all individual assets, say (to protect pensioners and those of limited means), and then knock one zero off of all bonds, mortgages, loans, savings accounts, debentures, etc. It's a kind of debt jubilee that preserves the basic architecture of lending and borrowing, of mutual obligation, and of business. No, it wouldn't be painless for the borrowers. There'd be a lot of unemployment, business closings, and other disruptions. But we'll get those anyway and worse. Fail to relieve the debt burden—and notice the scale at which this must be done—and homeowners will continue to walk away from houses underwater (what an apt phrase in a world of rising sea levels), companies will go bankrupt, and banks will continue to see their books swell with toxic assets, eventually leading to failure. They are already insolvent and that fact cannot much longer be concealed. Governments will attempt to prop them up, again. And currencies will fail. Ashes, ashes, we all fall down.

This book is attempting to talk to a bunch of addicts, to get them to admit that they are truly flat on their asses and that they should be grateful they are not yet flat on their backs. But I think Heinberg is smart enough to know that most addicts have to be face down in the gutter before they will stop whatever got them to that point, and we're not quite there yet. By hastening the day of that reckoning, he is attempting to enlist the wholehearted support of those who are presently paralyzed by uncertainty. Give up denial, get over your anger, and quit trying to bargain with the devil. The jig is up. There are some things we could usefully do

to reduce human suffering and preserve some of the values of the present era for ourselves and our descendants.

To that end, the author does his best to seal off all the alleyways by which skeptics might slip out of the trap. China does not represent a case for continued growth—they still have a century's worth of problems breathing down their neck and they and the world export market are going to run out of coal long before the Chinese government can solve them—maybe as early as next year. There are no silver bullets in the energy technology realm. Net energy is dwindling fast and there's little hope of replacing the gravy

be more gruesome than it actually is, I need to say that the hard case for limits is necessary if we are to get beyond the delusional behavior of present day economists, business mavens, and politicians—and much of the public. These people have to be stopped from doing anything more that will harm us all. The economy can't be revived—it can only be changed fundamentally. We're in a state of willful ignorance about that, and it's going to take some hard words and maybe some harder facts to wake us up. The point of all the argument for limits, however, is to get to the point of accepting them and moving on to solving

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### **Sadly, neither party is ready to face the music or speak truth to voters about the impossibility of repaying the endless trillions of dollars of outstanding I.O.U.s that the economy has racked up over the past 30 years.**

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of Saudi sweet light crude (already disappearing) with anything in sight. Not Arctic Wildlife Refuge soda pop, not Man of LaMancha wind farms, not deep ocean milkshakes, not ignite-your-drinking-water fracked gas, not exploding pipelines to the tar sands mecca up North. Nor any combination of the above. It's just physics; don't take it personally. When the energy you get back from a resource falls below 5 times the amount of energy it takes to extract it (some suggest 10x), society just plain bogs down. Too much effort is spent simply spinning wheels going nowhere. It's like getting caught in traffic on the way to the gas station—if it takes you eight hours to refill the tank, and when you get home there's very little left in it anyway, what's the point? Ethanol may return as much as 1.34:1—a bad way to convert petroleum and natural gas into a poor substitute for gasoline. Tar sands might arguably reach 3:1 if you don't factor in the destruction of half of Alberta and the pollution of a good part of the continent's fresh water supply. U.S. oil wells are dipping down to and below 10:1. And how valuable was that billion barrels of the Macondo well after all?

Let I make this fine effort out to

the problems we actually can solve. We cannot make the world's supply of fossil fuels expand adequately to replace those that we have used up. Without economic expansion fueled by oil we cannot pay our debts—anyone's debts. We can learn to share, adapt, conserve, regenerate natural capital, and work cooperatively and efficiently for the benefit of all. The saying has often been attributed to that fearsome optimist Winston Churchill that Americans will always do the right thing, after they have exhausted all other possibilities.

The last two chapters of *The End of Growth* are about managing contraction, redirecting society's aims away from material growth and toward spiritual renewal and improved quality of life, and they contain a very good array of solutions, including the suggestion that we build a national rail system serving every U.S. city to replace airlines and highways. Better we should have started that 40 years ago, but now is not too late. (Hint: it would cost less than the war in Iraq.) Given a referendum on the matter and the fact that over the next 30 years the net energy value of either seizing Iraqi oil reserves or conserving highway and airline fuel with railroads are about the same,

which would you have chosen? Don't you wish you'd had the chance to say so? Isn't that what democracy is supposed to be about? Maybe it would be nice if we tried it for a change.

Richard Heinberg is a quick study and he's given the literature of alternative economics and finance a thorough going over in the last year, so he's assembled a excellent overview of what I and other permaculture teachers have been advocating for the past two or three decades. He's had the benefit of some of the same teachers we've learned from: Hazel Henderson, Manfred Max-Neef, Herman Daly, Thomas Greco, Bernard Litaer. Using current news as well as long-term trends, *The End of Growth* makes the case for permaculture quite brilliantly.

It presents unarguable and immediate evidence of the need for systemic change, and it suggest that the damaged invisible structures of society—our money system

“sustainability,” and to do so very soon, will make any efforts to grow gardens and communities dramatically harder.

Recommended for all readers,

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**When the energy you get back from a resource falls below 5 times the amount of energy it takes to extract it (some suggest 10x), society just plain bogs down. Too much effort is spent simply spinning wheels going nowhere.**

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and its values—can be repaired, if we want to do so, though not by halfway measures. It also makes clear that our failure to address these aspects of

but especially for your beloved but blockheaded brother-in-law who thinks that the business cycle is about to restart.Δ

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## Something for Everyone Review by Peter Bane

**RACHEL KAPLAN  
with K. RUBY BLUME  
Urban Homesteading  
Heirloom skills  
for sustainable living**

Skyhorse Publishing. New York. 2011. 292pp. paper. Full color. 8x10. \$16.95.

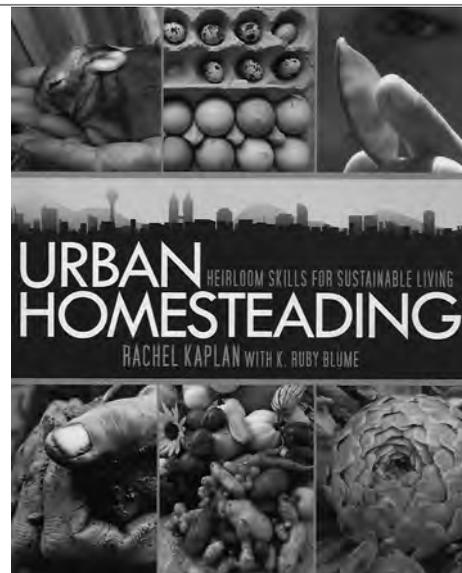
THROUGH THE MIRACLES of global trade, this splendid collection of good ideas on localization comes to us at an astonishingly low price. Rachel Kaplan is a lyrical and politically informed writer with a passion for permaculture and its applications in the city. She and co-author Ruby Blume have assembled 100 D.I.Y. projects and several dozen inspiring stories of urban homesteaders from just-getting-started gardeners to backyard goat farmers to rebuild-the-house-from-the-inside-out would-be architects. The result is impressive, and in its all-color format even glamorous, though my tidy mind wanted something more orderly.

The book is impressionistic with its lush color photos and artful design. High-quality typesetting and page layouts are attractive to the casual eye. There's a tremendous variety of subject matter and visual content. Subheads draw the reader in with provocative and even hip lines such as, “How do I know how much to grow?” and “Chickens are the new black.” The book is very smart that way,

assuming, rightly I think, that its audience is a certain well-informed and trendy cadre of environmentally-oriented urbanites (not to be confused with recycled sidewalks). Call them the grandchildren of Ruth Stout, who liked a good dry martini with her sheet mulch. I like the combination of artful and thrifty myself, and I have to admit there's good value here along with the glib and graceful writing.

As might be hoped for from two women authors, the values of inclusiveness and the demystification of many traditionally “guy” areas of knowledge are prominent, both in the selection of photos and examples, and in the step-by-step approach to explaining complicated tasks such as making cheese, siphoning the bathtub, or butchering a rabbit. Scattered among the eye candy of seed collections, farmers markets, and romanesco broccoli is a series of Get-Going sidebars, call them to-do lists for a new society: How to Start a Community Garden in 12 easy steps, How to get to Zero Waste in 60 months. These contain many good ideas, as much advocacy as action. Whew! It probably helps to look on the book as a hope chest of memes. If you did 10% of them in the first year after starting, you'd be a Hero of the Revolution.

In fact, there are so many side-tracks in this book that it could be argued the main stream has disappeared into an estuary of rich detail. Purposely or not, the linear organization of the text (if something this visual can still be called a text) is faint.



Though the author (it's mostly Rachel, but sometimes Ruby...) refers to chapters by number as well as name, the publisher has omitted any chapter numbers, either on the chapter faces themselves or in the table of contents. Oh well. There's also no index, so your fingers do the walking.

I'm still trying to reconcile this potpourri of well-chosen projects for home and life improvement with the orderly and thoughtful design process that underscores permaculture. The introductory chapter is brief but exquisitely written—as I read, I was envious of Kaplan's eloquence.

The greatest portion of information here looks to be sound and well-selected. In some areas, particularly energy, there are spurious statistics and uncritical or missing analysis. What, after all, is a “heat furnace” with no mention whatsoever of

fuel source? Or what does it mean that Americans use 11.4 kw compared to 0.2 kw for Bangladeshis? As a measure of relative wealth or profligacy this may be a fairly accurate ratio, but the units themselves make the numbers objectively meaningless. Okay, so Rachel and Ruby are artists not scientists. They obviously can make a lot of things with care and attention—maybe that’s enough.

Two other criticisms need to be registered here along with a small mountain of praise. First, my old eyes rebelled against reading the small serif font in which all the example stories were printed. The sans-serif text in the main body of the book isn’t too bad—wide pages and long lines work against readability, but there is plenty of white space and ample leading to compensate. The use of a third font style for the numerous captions and vertical rather than horizontal footers both add a little to the visual jumble. And secondly, the authors, by their own admission, have confined the examples to their home territory—the San Francisco Bay region. Despite the ample attention to conserving energy displayed in the book, the world portrayed here knows nothing of winter and little of North American summers. Talk of conserving 90% of electrical energy won’t go far with people living in less privileged regions.

The five sections, Getting Started, Gardening and Growing, Eating, The House, and Self-Care/City Care, the last one least expected, are notional groupings of three or four chapters. Each chapter in turn is a loose bag of vignettes, tables, short story examples (collectively referred to as ‘On the Ground’), advice, and gorgeous graphics. The information offered is well considered, mostly accurate, and maybe sometimes not enough to carry you all the way through. Witness the food forest explained in three paragraphs: a good drawing, two nice photos, an accurate concept well stated, some solid suggestions on perennial vegetables and fruits to use. Hey, if you’d never heard of forest gardening, that was a great starting point. In other areas, there’s a tantalizing and remarkable array of detail: How to Make a Bee Veil in nine easy steps, lovely recipes for elderberry syrup, hot ginger lemonade, and pickled garlic.

This is a useful book for beginners, authentic and helpful, full of innovative

systems being pioneered in tight urban spaces: wetland wastewater treatment cells made out of old clawfoot bathtubs, tiny chicken tractors to tuck into the narrow alley alongside your house, recipes for natural paints and plasters, plumbing details to turn four rain barrels into a bigger cistern. Here and there, the authors slip in handy tips for the renter, such as adapting the pipes to divert and use greywater without breaking your lease.

poultry tractors, living with goats. It may be compact, but it’s not lightweight. You could do a lot with what’s in here, and the energy is exuberant. When you’ve outgrown this, there are plenty of other sources to turn toward.

Kaplan and Blume pull no punches in describing the energy, environment, and economic predicaments brought about by global capitalism. They lay out the politics of seed, genetic manipulation, chemical

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## **This is a useful book for beginners, authentic and helpful, full of innovative systems being pioneered in tight urban spaces: wetland treatment cells made from old clawfoot tubs...**

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The Self-Care section encourages the reader to stay healthy, meet the neighbors, and ground out city stresses with time in nature and the inner world. It’s good advice for people living at a fast pace and with high levels of social and technological stimulus. Maybe that’s most of us.

I especially want to praise the authors for a forthright and compassionate section on raising small animals for food and fun, even including directions for butchering chickens and rabbits (though with neither photos nor drawings which could have been both helpful and discrete). This, in my opinion, sets the book apart from the merely clever garden manuals for which it might otherwise be mistaken. Breeds,

agriculture, and power production too, but the writing is so good, and the we’re-going-to-have-to-fix-this-mess-ourselves attitude is so positive, that there’s no hint of preachy about the book.

This would be an excellent gift for anyone you care about who lives in urban spaces and who hasn’t yet taken the plunge toward self-reliance but might be seduced into doing so by a pair of gutsy gals. That would include yourself. Many people will need the kinds of “heirloom skills” that the authors refer to in their subtitle, a good selection of which they serve up for their readers’ benefit. Not the last word on anything, but definitely good value for money. △

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## **A Family Album Review by Peter Bane**

### **COMMON GROUND Community Orchards Handbook**

Green Books. Dartington, UK. 2011. 229pp. paper. illustrated. 6"x 8". full color printing. \$24.95.

**V**ERY MUCH A COMMUNITY project in itself, this book was written in 2008 by two women, Angela King and Sue Clifford for the organization Common Ground. It has since been revised and republished by Green Books in the UK and is now distributed by their US partner,

Chelsea Green. Note should also be taken of the book’s designers, David and Toby Holmes, who have done a wonderful job of making a rich body of knowledge especially attractive and friendly.

This book has much to like about it, but if it had not been done so well, and were not so beautiful as it is, I would have declined to review it. Scanning through it reveals a fascinating world, one into which you are continually drawn by the lovely layout and the visual intimacy of the photos. There are children and posters of old apple products, endearing veteran trees holding their own on sunny hillsides, whole valleys in bloom, quirky and homey amateur orchardists posing on park benches. But the intimacy is stolen, or at

best borrowed, for anyone on this side of The Pond. The world herein portrayed—and it is a sumptuous and layered one—is well developed, mature, and consequently filled with a thousand details that do not exist in a younger and more raw culture. Simply put, this is someone else's family album. The book's very splendor, its wealth of detail, even its richness of language, render it much less useful to an American audience than to the people for whom it was written—the men, women, and children of Britain.

importance of managing orchards and hedgerows for wildlife, describe how to make juice, cider, and perry or to dry apples, and suggest other ways to give, share, or market the produce. Not least, there is an entire chapter on celebrating local abundance, starting with Apple Day, October 21st. The book's last chapter details some 20 orchard and wild fruits with insightful commentary and referrals to many local groups doing preservation or processing. An extensive set of appendices provides detailed model leases, contracts,

any number of transferrable ideas—for PR, for promotion, for clever tactics, or simply for inspiration. A capable attorney could probably make use of the sample leases or charters, since English common law forms the basis of much of American law. Basic facts of pomology are not widely known, but are presented here in an appealing package. And no one who loves fruit could turn a blind eye to the images of children bobbing for apples, wassailing rituals, or poultry and sheep grazing bucolically under the trees.

*Community Orchards Handbook* is just that, a handbook that goes with the trees, their trees, over yonder in that green and pleasant land. It speaks of and to a people concerned with keeping the past alive and well. But planting and caring for trees is inherently a conversation with the future, something Americans should be willing to engage. A few daring readers might want to make this a guidebook for an orchard tour of Britain—and for that it would serve well. Book your tickets while the planes are still flying. There's nothing I could find in the text about adapting orchards in the face of climate change, so in the brave new world of the 21st century, the past can only provide partial guidance, some of it probably wrong. Δ

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## The book's very splendor, its wealth of detail, even its richness of language, render it much less useful to an American audience than to the people for whom it was written...

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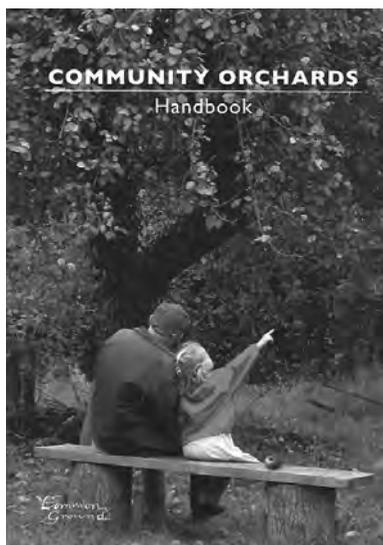
Though some have been lost and others are threatened, the orchards of Britain present a legacy of centuries of care for and living intimately with the countryside. Not of few of them are central and much-loved features of towns and villages throughout the country, occupying churchyards, village commons, scraps of parish- or council-owned land, or simply the back acreage of an ancient estate. The aim of this book and of Common Ground who have created it, is to preserve, enhance, and expand this legacy, an admirable, even noble project worthy of support and emulation.

To this end, the book presents a plea for orchards as an expression of local distinctiveness, explains their special place in British culture and landscape, and offers some recent success stories of land and orchards saved from development. The book goes on to offer a road map for starting a community orchard, covering all the bases from legal agreements and insurance to public relations and organizing volunteer workdays, including health and safety issues. There is much more than this. The readers are encouraged to survey wildlife, map old and valuable apples and other fruits, spread the passion for orcharding, preserve local varieties, and are given valuable advice on rescuing threatened plots. One chapter covers the details of planting a new orchard; another provides guidance for reviving an old one. Additional chapters pitch the

and organizational support.

This is a book for action as well as a beautiful artifact. Indeed, it is a one-stop shop for community orchard enthusiasts in Britain. Surely most if not all of the groups working in the UK are listed, and this includes such information as who rents cider presses, when and for how much.

There is a small but growing movement to create community orchards in the US. Our Midwestern town has one already, stumbling its way forward. Lacking a culture of care for common land, however, Americans are a bit out to sea in this realm. But people of goodwill are likely to find some way forward—and doing so will be important for the future. For such activists, this book could offer



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## Ordinary Heroes Review by Peter Bane

**DAVID TRACEY**  
*Urban Agriculture*  
*Ideas and designs*  
*for the new food revolution*

New Society Publishers.  
Gabriola Isl. BC. 2011.  
245 pp. paper. illustrated. 8 color  
pages. \$21.95.

I LIKED DAVID TRACEY'S 2007 book *Guerrilla Gardening*. He says, in contrasting this with the earlier work, that then he felt people should garden the city, and now he believes they should farm it. Tracey's writing is glib, funny, and assumes a hip familiarity between himself and the reader. The style makes *Urban Agriculture* a pretty quick read. While it covers many of the same concepts as *Urban Homesteading* by Kaplan and Blume (see review this section), it is written in a more narrative if still breezy style. Written puns usually go over with

fewer groans than spoken ones, and if you have any appreciation for them, you'll enjoy that Tracey scarcely misses a chance to turn his subheads into subversive memes. I think he must have been in advertising before he began promoting city farming.

Just as Kaplan and Blume portray the technicolor world of San Francisco Bay, Tracey is tied closely to his own world city further up the coast, Vancouver. A little more grey and gritty, though no less dramatic, ethnic, or wealthy, the side of the city he shows us is deliberately outside the middle class mainstream. As if by way of explanation, he offers us a story of trying to get a community garden going in a seafront public park, borrowing a little strip of disused lawn behind some tennis courts. The well-heeled *entitledati* turned out in droves to scowl him down—the project went nowhere. Korean, Filipino, Chinese, and Latino gardeners, on the other hand, show plenty of affinity for good food and good soil.

Meant for the uninitiated or even the skeptical, *Urban Agriculture* is laid out in a series of easy lessons, starting with foods that can be grown completely indoors—in the kitchen or the basement—and proceeds by stages through potted plants and container gardens, into the backyard, then the front and side yards, then to community gardens, at last, completely out of the box with borrowed yards, public spaces, and citywide ambition. This includes tree cropping. Along the way he salts in basic elements such as seeds, soil, water, tools, structures, and enough politics to keep you aware of what got him going in this direction to begin with. Each chapter presents one or more stories of successful entrepreneurs, hard-working immigrants, chicken enthusiasts, or school garden reformers. No one is making a killing, but lots of different people are drawn to this—the authors claims there are 800 million urban farmers worldwide.

Using Will Allen and Milwaukee's phenomenally successful Growing Power as a touchstone, and permaculture-trained farmers on a coop holding in the Fraser Valley as the epitome of dyed-in-the-wool, living-the-life urban growers, Tracey offers us a wide range of niches for which aspiring city farmers might aim: the sprout gardener (with bicycle delivery), the coop CSA, the winter grower, the fish farmer, the seed saver, the tool merchant.

Any of these might make a partial living and eat well to boot. The author takes a journalist's perspective, setting up occasional straw men and making the devil's advocate case from time to time, perhaps to burnish his street cred and perhaps to match his amateur status as a grower (home vegetables, most seasons). To his credit, he doesn't attempt to glamorize the phenomenon, even if he is strongly in favor of it.

If you'd like to dip a toe into urban farming, or if you find yourself backing into it, this book could help, mainly by giving permission and pointing at lots of tiny enterprises that are growing,

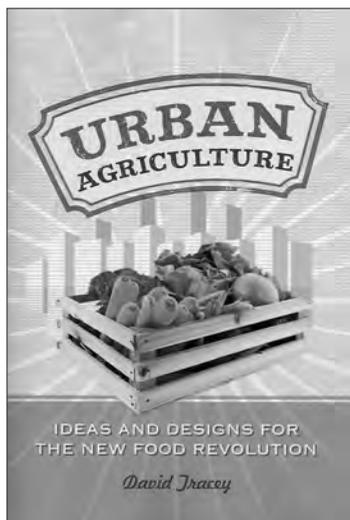
after his family dairy was engulfed by suburban sprawl. He taught and advocated organic farming at the local university, and got the province of BC to adopt model land preservation laws 30 years ago that have contributed, Tracey asserts, to a higher quality of food and nutrition in locally grown produce there than most places in North America. The same laws also kept out corporate farming, no mean achievement given the arc of recent history.

That, in the end, is the main point—eating better and living healthier lives, taking responsibility for and ownership of our food. Punctuating his look at the world city from inside Vancouver's many

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## Meant for the uninitiated or even the skeptical, *Urban Agriculture* is laid out in a series of easy lessons, starting with foods that can be grown completely indoors...

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experimenting, figuring things out. About stage three (backyard gardening), the author opens up a conversation about design, but he doesn't try to give much guidance. However, he does present examples at every scale, which could help readers gauge how to position themselves; his examples talk about farm history, business plans, group organization, and political struggles. You learn by indirection. The emphasis is still on action that, while common, remains outside the mainstream and definitely bottom up. The closest we get to a view from inside government is the story, running through several chapters, of a stubbornly organic veteran farmer who turned city councillor

neighborhoods with field reporting from Milwaukee and Havana, he spotlights community values at every scale of growing. The paid-better-than-average Havaneros include a high proportion of people with advanced degrees and some with advanced years, but the main gain for them, it seems, is good company during the day and something rewarding to do. Good food doesn't hurt either.

You can get a glimpse into Tracey's writing from the excerpt on page 9 and judge for yourself. I found the book appealing and honest. I wouldn't hang too much on his statistics—I think he fell into the 'meat is a major source of greenhouse gases' distraction—but the human stories are distinctive and varied, and he's not afraid to report about low wages and sore backs right along with the many small acts of ordinary heroism. △

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## Answering Hunger Review by Peter Bane

**DAVID KENNEDY**  
*21st Century Greens*  
*Leaf vegetables in nutrition and sustainable agriculture*  
Leaf for Life. Berea, KY. 2011.  
257pp. paper. 8.5"x11" horizontal.  
illustrated. \$24.00

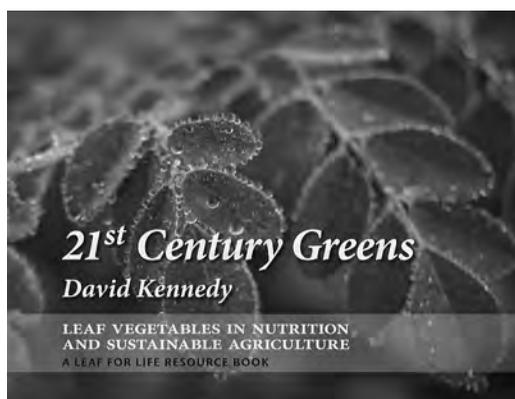
DAVID KENNEDY has been at work on this book for a quarter-century. It is a remarkable testament. Arriving here just days before we went to press, its appearance struck me nearly dumb, like a message in a bottle or a long-lost brother knocking at the door. Kennedy and his colleagues, working in the poorest countries of Latin America, but also in India and southern Africa, have been contemplating widespread hunger and malnutrition during a time of unprecedented economic growth and prosperity among the world's elites. Kennedy and Leaf for Life have used their purchase on American society, where so much is easy and nutritional problems run to obesity rather than obvious undernourishment, to crack this stubborn nut—traveling, writing, and researching. During most of this time, at least for the 20 years I've been aware of their efforts, they have been doing everything possible to expand their understanding of leafy greens, which they early on determined lay in the critical path toward adequate diet for all.

Green leaves, though common enough in western diets, are consumed too little among the world's poor, who tend to apply their limited incomes and efforts to acquire starchy foods that sate immediate hunger. But leaves—and a curd made from concentrating and heating the juice of them—besides supplying many micronutrients, are especially rich in iron, calcium, Vitamin A, and protein. These address the most widespread and acute causes of malnutrition. As the author points out, few people today suffer from scurvy, but many are anemic from a lack of iron or zinc or have too little calcium and protein in their diets. Green leaves are everywhere and billions of pounds of them are more or less a waste product of agriculture.

Green leaves are not just an answer for the poor of the global South (Kennedy calls this 'traditional malnutrition,' but directly address the failures of industrialized diet which are generating an epidemic of type-2 diabetes and other metabolic diseases.

This book presents every imaginable approach to understanding and using green leaves for food, from direct eating and cooking, to curd concentrates, to

cover cropping with plants whose leaves are edible, to edible tree leaves. *21st Century Greens* presents a treasure trove of information, carefully gleaned and beautifully organized on identifying, growing, harvesting, preparing, and serving green leaves as food. It contains guidance on changing dietary habits, on incorporating green leaves into other foods to make them more readily accepted and more easily served. It contains information on drying leaves. It addresses problems of pollution in food, water, and soil. It discusses pesticide use, why it has failed, and how it may be addressed to limit dangers to people. It presents a short course in agriculture that would be an excellent primer for new permaculture designers. It gives an excellent, in depth,



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## **Green leaves are not just an answer for the poor of the global South, but directly address the failures of industrialized diet which are generating an epidemic of type-2 diabetes and other metabolic diseases.**

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and thoughtful overview of human nutrition, both at the level of the body and as a social phenomenon.

This work, based on careful and multi-disciplinary research, has been compiled by a network of grassroots activists, agronomists, and researchers. It is not the product of the university or of corporate or government funding, but has been carried out entirely by civil society, sometimes drawing on published academic work, of course. As such it stands witness to the permaculture critique of the global economy: institutions largely stand in the way of solving the

world's most pressing problems. Where they have not overtly created them, they certainly reify them. Individuals and small groups can, in fact, solve many of those problems, but are seldom in possession of the modest resources required to do so. This is a case of heroic discipline and persistence in the face of appalling official incompetence and apathy. You can read the prayer just barely between the lines of Kennedy's text: please let government and corporations keep their damned hands off this—because it can really work, and they are topnotch at screwing things up royally.

I don't care for the horizontal format of the book, but it does lay open for hands-free reading (or cooking from the many mouth-watering recipes). The language is clear, humble, and gripping.

Simple in format, with screened leaf patterns in the light grey background of every page, and adorned by numerous photos, tables, and dozens of lovely drawings, this book is a near miracle. I cannot recommend it highly enough to all permaculture designers, cooks, nutritionists, and of course to health and aid workers at home and abroad. Among the many thoughtful and practical elements in the book, Kennedy offers a succinct list of research projects that could further adoption and universal practical

application of green leaves in the diet and in agriculture. These include innovations in simple processing technology, use of leaf concentrate for disaster relief, further research on eating the leaves of cover crops, research into the potential of water hyacinth for leaf concentrate, and a dozen more.

If you just bought this book to support the work of Leaf for Life, it would be money well spent, but I can't imagine anyone with an interest in permaculture who wouldn't find it fascinating, compelling, and very practical. △

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## Fish in the Bathtub, Plants on the Sill Review by Peter Bane

**SYLVIA BERNSTEIN**  
***Aquaponic Gardening***  
***A step-by-step guide to raising***  
***vegetables and fish together***  
New Society Pub. Gabriola Isl. BC. 2011.  
257 pp. paper. 7.25"x9". illustrated.

**L**ONG PUT OFF by the artificiality of hydroponics, I gave little thought to aquaponics until this book came my way. I am interested in raising fish, but haven't yet, so I'm trying to learn what I can in preparation for the time when we have the room for fish tanks. This is a technical book. It's full of water chemistry, bacterial reactions, plumbing fittings, and fish sex ratios. It's also written by an attractive middle-aged Jewish lady executive who

and containers, whether bathtubs, stock tanks, or barrels. Aquaponics is one step beyond recirculating tank systems. Both use bacterial filters that support nitrifying microbes to convert ammonia from fish waste into nitrates. The plants suck up the nitrates, keeping the fish healthy. The concept is simple. The execution is fiddly, but from the testimonials in the book, it's obviously something your average L.A. female computer programmer can pull off in her spare time with aplomb. Aquaponics geeks are everywhere and they apparently come in all shapes and sizes.

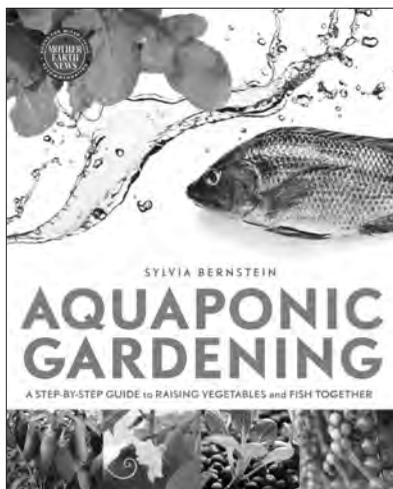
Bernstein is good on details; you have to be in order to do this. Once set up, the systems need slight daily attention, weekly testing, and occasional interventions. It probably has to become a minor obsession. The reward is fresh fish and easy gardening, by which I mean no weeds, few bugs, and happy plants. Water will be spilled.

As a promoter, Bernstein has evaluated the likely pathways to setting up various

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**The reward is fresh fish and easy gardening,  
by which I mean no weeds, few bugs, and  
happy plants. Water will be spilled.**

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happens to have an unreasonable passion for raising fish and vegetables in her basement (even if she has a hard time killing the fish to eat them). I thought I should give it a look-see.

I learned that aquaponics always combines fish with plants. The fish produce wastes and the plants eat them up, purifying the water that is then returned to the fish tank. So, basically you have to understand plumbing fittings, pumps,

kinds of systems, and has clear opinions. She gives lots of how-to tips and where-to-find referrals. There's a buoyancy about the book that, while not ignoring potential problems, seems to take them in stride, finding the work and the yields well worth the effort. Not everyone might agree, but if you have a leaning toward fish, this approach could work—for almost anyone.

The Achilles heel of aquaponics, as with other intensive aquaculture systems, (1 lb. of fish per 5 gal. of water!) is the feed, produced industrially from fishmeal, corn, soy, and various minerals and compounding agents. It raises fish quickly under good conditions. In the US, the corn and soy will be GMO. If you raise omnivorous fish, you can supply most of their feed from material you grow or harvest locally, but getting the vitamins right can be tricky. It's still worth exploring.

For the technical information alone, not to mention the clear and enthusiastic writing, this book is well worthwhile and furthers the much-needed development of home-scale aquaculture. △

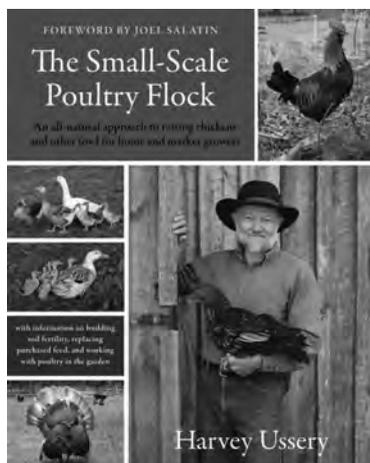
## Last Word on Birds Review by Peter Bane

**HARVEY USSERY**  
***The Small-Scale Poultry Flock***  
***An all-natural approach to***  
***raising chickens and other fowl***  
***for home and market growers***  
Chelsea Green Publishing.  
White River Junction, VT. 2011.  
382pp. paper. 8"x10". all color. \$29.95.

**H**ARVEY USSERY is a *flockster* (his term) from northern Virginia with a lifelong love of poultry. If you wonder what there is to raising chickens (and turkeys, ducks, geese, or guineas) that could possibly fill 382 pages, consider chapter 27, Working with Broody Hens. This is serious chicken talk. Harvey is strongly opinionated and richly experienced, and he writes with verve and style. You feel that he is talking directly to *you*. *You* would be a backyard poultry fancier or someone intending to supply eggs or meat or breeding birds to a local market. You can raise birds entirely for home use and entertainment and still benefit from this book, but if you are thinking of doing anything commercial, on any scale from eggs for the neighbors right on up to a CSA, this is what you need.

Of course he writes about planning and starting, buying and incubating, housing, watering, and fencing the flock. There is a chapter on deep litter, another on pasturing, and a whole chapter on electronet (just what it sounds like). There's tillage from the birds, putting them in the garden, compounding feeds, buying or growing your own, and cultivating worms and soldier flies as feed. Wondering about predators, protection, guardian dogs, llamas? All here. Then there's reproduction, health, breeding and selecting, conservation, timing, and butchering (complete with detailed sequential photos). And, not to be missed, a whole chapter on recipes and cooking with poultry. Oh, did I mention marketing to local customers, or other ways to make income from your birds? And eight appendices, including plans for a mobile A-frame, Spreadsheets for tracking egg and broiler Costs and Profits, a recipe for Duck Confit contributed by the author's wife Ellen, and...well, you get the picture. If it's not in here, you don't need to know it.

Harvey's philosophy—here I am talking as if we're old friends—is natural. Conform your management to the bird's needs, follow nature's direction (minimum veterinary intervention, cull the weak), employ rigorous hygiene, pay close attention, and be vigilant against predators (who deserve respect and a place in the ecosystem, just not in the henhouse). The book is easy to read, being both intensely practical and passionate. The author is reflective and, despite claiming to be “a hick with chickenshit on his boots,” well educated, and P.D.S. (pretty damn smart).



He commands the details without ever losing the big picture. You know, as you read, that you are in the hands of a master. From a thorough tour of chicken anatomy and physiology to flock behavior and the Inner Chicken, you are led through the mysterious, wonderful, and rewarding world of the Biggest Bird (global chicken biomass exceeds 10 million tons).

The book's layout is spacious, with plenty of good photographs, plus an index, a glossary, extensive notes, and a generous collection of resources. In the finished book there will be color printed elements to help differentiate the many sidebars.

Joel Salatin, who's raised hundreds of thousands of birds on pasture, writes a ringing endorsement in the foreword. Despite picking this up at the end of a long run of reviews and late in the day, I couldn't put the book down. And I don't even own a chicken today!

So you know I like it, but the title is literary. This isn't really a book on all poultry. Ducks, geese, guineas, turkeys, and the rest get nine pages. They're good pages, but less than 3% of the book. The other white and dark meat also come and go as bit players in the chicken opera—the

bantam mother hen who hatched out a gosling, and similar outrageous tales. Harvey has raised them all; he can contrast and compare other birds. But he loves chickens. That's fine—someone else can write the masterwork on turkeys. Dave

Holderread's about the best on waterfowl, but his books are going to need updating one of these days. There's still plenty of room for aspiring writers to contribute to agriculture. But on chickens, ladies and gents, meet the big flockster. △

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**The author is reflective, educated, and P.D.S. (pretty damn smart). He commands the details without ever losing the big picture.**

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## Field Lessons Review by Peter Bane

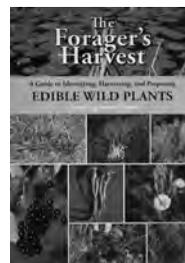
**SAMUEL THAYER**  
*The Forager's Harvest Guide to Identifying, Harvesting & Preparing Edible Wild Plants*  
FreshPaintDigital. 2010.  
3+ hours. DVD. 2 discs. \$22.95  
[www.foragersharvest.com](http://www.foragersharvest.com)

**S**AM THAYER is one of this generation's standout wild food mavens. He lives in the wilds of northern Wisconsin with his family. Author of two excellent books on North American wild foods, he is the narrator and star of this set of film field guides.

Organized as a series of scenes on 32 wild plants, the DVD set begins with a simple written caveat—know what you're doing and be responsible—and segues into an alphabetical sequence of short lessons, beginning with Basswood and continuing through Wood Nettle. The selection is drawn from Sam's first book, *The Forager's Harvest*.

Sam is an articulate and forceful writer and, remarkably enough, is also a fine speaker. He's young, handsome in a Viking sort-of way, exhibits a droll humor, and is not nervous for the lens. He's on camera almost the whole time, though a few brief scenes are merely voiceovers.

The editing and camera work are competent but not fancy. Sam and his friend Brian Pierce, working the camera, went out to familiar territory and shot the scripts, recording what Sam's website refers to as “foraging antics.” They may have been working from written notes, but there's a strong feeling of Sam just talking about the plants he knows and



doing so almost off the cuff. They haven't tried to edit out a few ‘ums’ and a verbal stumble or two. The scenes take place at various seasons from spring to fall, so Sam's wearing different casual clothing and his hair goes from combed to just-

rolled-out-of-bed, to wet-from-the-shower. He squats, sits, sprawls, or stands, always comfortable in his body, and does a pretty good job of looking at the camera; you can see a few off-camera distractions from time to time. Sometimes he's knee deep in swamp water fishing for cattail rhizomes. Sometimes he's eating and talking with a mouth full of nannyberries. None of this seems to phase him, or keep him from delivering solid information concisely. He's at ease in these settings, having taught many workshops on wild edibles, and doubtless is used to instructing friends and family who traipse along with him on foraging trips.

Each plant is introduced by its season, habitat, and identification, with clear instruction as to which parts are edible and at what stage. These scenes are all filmed in the field. Preparation may be as simple as peeling, or as elaborate as pureeing (choke cherries) and making fruit leather. For such complicated processing, the crew repaired to Sam's kitchen, though at one point he's cooking milkweed pods on a camp stove in the woods.

One notable feature of the DVD is the deliberate repetition of subtle processes (e.g., peeling cattail rhizomes). This is what a good, knowledgeable teacher does in response to those quizzical looks from students, so viewers gain the advantage of Sam's teaching experience.

For the visual learner, this DVD will amplify the already high value of the books. △

# EVENTS

## International Permaculture Conference & Convergence

Jordan

**Dates:** September 16-17, 19-22, 2011

**Location:** Amman; Wadi Rum

**Description:** The next International Permaculture Conference and Convergence, IPC10, will be held in Jordan across September. The theme is "Plan Jordan ~Water." The one-day conference will be held in Amman and coordinated by Nadia Lawton. The four-day convergence at Wadi Rum is open only to PDC graduates. A PDC course will be held prior.

**Cost:** Costs vary depending upon participation. Please visit the website for more information.

**Contact:** Nadia Lawton  
PRI Jordan  
1158 Pinchin Rd., The Channon  
NSW, 2480, Australia  
info@ipcon.org  
www.ipcon.org

## Permaculture Design Course

Trinidad, West Indies

**Dates:** November 4-13

**Location:** St. Ann's, Trinidad

**Description:** Join us for our 5th annual course at WaSamaki Permaculture. We are condensing this course into an intensified 10 days to meet the needs of those who cannot take two weeks away. Course lectures include all of the traditional design course components along with specific information for our region.

**Cost:** \$1,000

**Contact:** John Stollmeyer  
868-624-1341  
Erie Rahaman-Noronha  
868-673-4180  
www.wasamakipermaculture.org

## Permaculture Design Course

Interior British Columbia

**Dates:** September 12-October 21

**Location:** Selkirk College, Nelson, BC

**Description:** Learn the basic permaculture design principles and techniques and develop the practical skills to design and implement sustainable designs for ecological landscape and backyard. This six-week intensive training program combines theory with practical hands-on activities.

**Instructors:** Gregoire Lamoureux and guests.

**Contact:** Gregoire Lamoureux  
250-226-7302  
spiralfarm@yahoo.com  
www3.telus.net/permaculture

## Permaculture Design Course

British Columbia

**Dates:** August 14-27

**Location:** Winlaw, BC

**Description:** This is the 72-hour design course which combines theory with practical hands-on learning. Topics include: design techniques and principles, site analysis, soil fertility, organic gardening, herbs and medicinal plants, fruit and nut trees, water uses, and ecological buildings.

**Instructors:** Gregoire Lamoureux & guests.

**Cost:** CAN\$1,050.

**Contact:** Gregoire Lamoureux  
250-226-7302  
spiralfarm@yahoo.com  
www3.telus.net/permaculture

## Permaculture Design Course

British Columbia

**Dates:** August 28-September 9

**Location:** Fry Creek, BC

**Description:** Alter your ECO! Join the solutions-oriented global family of permaculture! Susan Grimble and Richard Taylor are hosting the course at their beautiful homestead at the north end of Kootenay Lake. This site has received so much loving care and good-sense development over the last four decades that it is likely to levitate itself right off the planet. Learn to: integrate multi-functional and regenerative designs for living; grow healthy food and nurture the land; co-create designs that conserve water, energy, and time; deepen your connection with the wisdom of nature.

**Instructors:** Zia Parker, Jim Gibson,  
Gregoire Lamoureux

**Cost:** CAN\$950.

**Contact:** Susan Grimble  
250-366-4395  
250-352-3449  
susangrimble@telus.net  
willowwaywellness.com/blog/2010/11/  
kootenay-permaculture-design-course/

## 11th Bioregional Congress

Pacific Northwest

**Dates:** August 19-27

**Location:** Birch Creek Arts & Ecology  
Ctr., Southern OR

**Description:** At a Bioregional Congress we gather in ceremonial village as a strong and diverse cultural presence, representing inhabitants of bioregions across the continent and beyond. The congress will include mornings of small talking circles, big group circles and meetings; afternoons of hands-on workshops and evenings of cultural sharing and celebration.

**Cost:** Varies. Basic rate \$500/person.

**Contact:** info@bioregionalcongress.net  
www.bioregionalcongress.net

## Forest Garden Design Advanced Design Course

Pacific Northwest

**Dates:** August 22-29

**Location:** Ashland, OR

**Description:** This landscape design course expands where the basic PDC leaves off. This is a professional level course covering the entire design process: goal setting, site assessment, concept development, design, implementation, and maintenance. You will go in-depth about how to plan for patch succession, select the appropriate plant species, build guilds, and how to establish your forest garden. Introduces drawing and computer automated design (CAD) skills. You will get hands-on design time on a project that you bring to the course. This course is ideal for professional landscape design continuing education.

**Instructors:** Chuck Burr and Larry Korn

**Cost:** \$800 discount for couples and those taking Teacher Training.

**Contact:** Chuck Burr  
SOPI  
541-941-9711  
courses@sopermaculture.org  
www.sopermaculture.org

## Social Forestry

### Advanced Design Course

Pacific Northwest

**Dates:** Oct. 21-23 and Nov. 11-13

**Location:** Little Applegate, OR

**Description:** This course introduces students to social forestry, a field of ecosociology that connects villages and communities to their forested water catchment basins. Here in a developed industrial empire, the forests are lonely. We have lost our sense of living with forests as friends. This course will explore reconnecting with forests through ecological knowledge, the use of hand tools and woodcrafts, seasonal festivities and work cycles, children's stories, pilgrimages, and covenants.

We will learn ecological assessment, carbon sequestration methods, restoration forestry, and the crafts and products that can be enjoyed while we are re-establishing our heart space and wonder in the woods.

The PDC is a prerequisite for getting an advanced certificate for this course, however, you may have the certificate held until PDC completion in the future. The course is open to all who have a working knowledge of permaculture.

**Instructor:** Tom Ward

**Cost:** \$420 if paid in full by 9/25;  
\$500 after. Includes camping.  
Meals are not provided.

**Contact:** Siskiyou Permaculture  
541-482-7909  
www.siskiyoupermaculture.com

## Permaculture Teacher Training Pacific Northwest

**Dates:** August 10-14

**Location:** Ashland, OR

**Description:** Permaculture design and implementation is vital, and building and honing your skills as a permaculture teacher is an investment not only in your own work, but in the communities you will work with. Learn how to teach permaculture concepts and practical applications to a variety of students with diverse learning styles. Prerequisite, PDC.

**Instructors:** Chuck Burr and others.

**Cost:** \$600, includes camping, meals.

**Contact:** Chuck Burr

541-941-9711

courses@sopermaculture.org

www.sopermaculture.org

## Permaculture Design Course Southern Oregon

**Dates:** Weekends, February 11-March 18, 2012

**Location:** Ashland, OR

**Description:** Taking a permaculture design course at Restoration Farm is like getting two courses in one. It is about the food we are eating, how we grow and prepare it, plus you will get all of the teaching of a PDC. Food is crucial to how we live every day and how we organize our communities. Your meals at SOPI integrate food and permaculture. Held twice a year on a working permaculture farm, the SOPI PDC gives you hands on experience with inspiring permaculture design examples. During the course we will continue transforming part of a former hay field into permaculture paradise. Participants also gain real-world design experience with their group design project. The curriculum closely follows the complete original teachings by Bill Mollison. We address all types of design urban/suburban, homestead to farm-scale. Also covered at the end of the course are social structures of how to start community.

**Instructors:** Chuck Burr and Larry Korn.

**Cost:** \$625.

**Contact:** Chuck Burr

541-201-2688

courses@sopermaculture.org

www.sopermaculture.org

**Books and Videos**  
for sustainable systems  
available from

**PermacultureActivist.net**  
PO Box 5516  
Bloomington IN 47407 USA

## 11th Annual

## Permaculture Teacher Training Pacific Northwest

**Dates:** August 7-13

**Location:** Cottage Grove, OR

**Description:** Empower yourself to advocate for change through whole systems design and teaching. In this dynamic and interactive course, you will learn significant teaching techniques to communicate permaculture principles and strategies in a wide variety of settings. This teacher training unfolds as a design methodology and advocates the permaculture design course curriculum. The course encourages and inspires your unique strengths and talents demonstrating diverse teaching modalities such as lecture, facilitating class discussions, storytelling, and other modalities.

**Prerequisite:** Permaculture Design Course certificate. Limited to 15 participants. Practicum August 15-16.

**Instructors:** Jude Hobbs, Andrew Millison.

**Cost:** \$775 before 7/25; \$825 after.

\$225 for Practicum.

**Contact:** cascadiapc@gmail.com

www.cascadiapermaculture.com

## 21st Annual

## Permaculture Design Course Pacific Northwest

**Dates:** December 1-14

**Location:** Lost Valley Education Center  
Dexter, OR

**Description:** Permaculture is a design system for sustainable human settlements based in the unique characteristics of each place. Permaculture design offers ways for you to create a prosperous culture by conscious, sustainable use of resources in all aspects of living. The time to plan for a resilient and abundant future is now. Course topics include: ethics and principles; mapping and design exercises; natural cycles and pattern recognition; garden design and establishment; useful plants and planting strategies; water harvesting, management and conservation; soil building and ecology; animals in the system; forests, agroforestry, and tree crops; eco-building and appropriate technology; urban permaculture and village design; and cooperative economics.

**Instructors:** Marisha Auerbach, Dave Boehnlein, Kirk Hanson, Kelda Miller, Jenny Pell, Rick Valley, Leonard Barrett, Mark Lakeman, Michael Pilarski

**Cost:** \$1,250 includes meals and accommodation.

**Contact:** Marisha Auerbach

360-273-7117

queenbee@herbnwisdom.com

## Permaculture Design Course Central Oregon

**Dates:** August 8-26

**Location:** Corvallis, OR

**Description:** Back to school! This course can be taken through Oregon State University for college credit. This course takes place on campus where we are establishing demonstration gardens. We blend classroom lecture with hands-on work, field trips, observation and design exercises, and top-notch guest instructors to cover the core permaculture curriculum and ever expanding teachings. Convenient and bike-friendly in-town location while in the heart of the Willamette Valley and its beautiful rivers, farms, and forests. Class is Monday to Friday with the weekends off.

**Instructors:** Andrew Millison with Jude Hobbs, Marisha Auerbach, Heiko Koester, Mark Lakeman, Tao Orion, Mike Hatfield, and others.

**Cost:** \$800 tuition only.

**Contact:** amillison@gmail.com

541-752-9118

www.beaverstatepermaculture.com

## Permaculture Design Course Interior Pacific Northwest

**Dates:** August 8-23

**Location:** Sandpoint, ID

**Description:** Called the most important design system of the 20th century, permaculture uses the patterns found in nature to integrate human systems (food, shelter, water, energy, health, waste, economy, and community) into a unified whole. This residential course is the 1st Annual North Idaho Permaculture Design Course.

**Instructors:** Michael Pilarski, Marisha Auerbach, and local guests.

**Cost:** TBA.

**Contact:** gentleharvest.org/events.shtml

## Permaculture Design Course Western Washington

**Dates:** Weekends, September-February

**Location:** Tacoma, WA

**Description:** Over eight weekends discover the heart of Tacoma with a focus on urban issues, advanced design, daily hands-on projects, and a great speaker series.

**Instructors:** Kelda Miller, Marisha Auerbach, Jordan Fink, and guests.

**Cost:** \$900-\$700.

**Contact:** sustainableatacomapierce@gmail.com

divinearthgp.com

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## Permaculture Design Course

Northern California

**Dates:** September 2-17

**Location:** Bolinas, CA

**Description:** If you want to immerse yourself in the world of permaculture and experience life on a working permaculture farm, join us for this two-week course. Our experienced team of instructors will provide you with knowledge and inspiration for making meaningful changes in the way you view and interact with the world around you. You will observe and use the same principles that make ecological systems self-sustaining, and learn how to apply them to integrate homes and gardens. You will learn how to apply these principles to energy systems, water supplies, healthy communities, ecological economies and global political movements.

**Instructors:** Penny Livingston-Stark, and guests TBA.

**Cost:** \$1,500

**Contact:** Regenerative Design Institute  
415-868-9681  
info@regenerativedesign.org

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## Permaculture Design Course

Northern California

**Dates:** September 17-30

**Location:** Occidental, CA

**Description:** Two residential permaculture design courses will be offered at the Occidental Arts and Ecology Center. Each is a two-week course in land-use design based on the sustainable living philosophy of permaculture. Topics to be covered include permaculture theory, food diversity, soil enrichment, water use, erosion control, natural building, organic gardening, forest farming, and more.

**Instructors:** Brock Dolman and guests.

**Cost:** \$1,500; \$1,400 if registered two weeks in advance. Meals and lodging provided.

**Contact:** Occidental Arts and Ecology Center  
707-874-1557 x201  
www.oaec.org

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## Earth Activist Training

Northern California

**Dates:** January 7-21, 2012

**Location:** Cazadero, CA

**Description:** Two weeks that can change your life and change the world! A permaculture design course with a grounding in earth-based spirituality, and a focus on organizing, activism, and social permaculture as well as urban and rural land-based systems. Learn how to heal soil and cleanse water, how to design human systems that mimic natural systems, using a minimum of energy and resources and creating real abundance and social justice. Explore the strategies and organizing tools we need to make our visions real, and the daily practice, magic, and rituals that can sustain our spirits. Participatory, hands-on teaching with lots of ritual, games, songs, and laughs along with an intensive curriculum in ecological design.

**Instructors:** Starhawk and TBA.

**Cost:** \$1,400-\$1,800 sliding scale.  
Work trade and scholarships available, apply early!

**Contact:** 800-381-7940  
earthactivisttraining@gmail.com  
www.earthactivisttraining.org

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## Permaculture Design Course

Southern California

**Dates:** October 31-November 13

**Location:** Quail Springs, CA

**Description:** This course covers the permaculture curriculum for certification, and includes hands-on learning in a diversity of applied topics that lead to sustainability for individuals, families, businesses, and communities. You will learn to design and apply natural principles to create stable and resilient systems that provide food, water, shelter, and energy needs while regenerating ecology, community, and economy.

**Instructors:** Warren Brush and guests.

**Cost:** \$950 before 9/1; \$1,250 after.  
Some partial work trade and payment plans available.

**Contact:** Quail Springs Learning Oasis and Permaculture Farm  
info@quailsprings.org  
www.quailsprings.org

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## Permaculture Design Course

Colorado Front Range

**Dates:** September 9-22

**Location:** Sedalia, CO

**Description:** Learn how to design sustainable and regenerative systems that are in balance with the natural world. Based on the traditional curriculum, this residential course will also incorporate Woodbine's commitment to indigenous values and sustainable communities. Sessions on traditional ecological knowledge, and social and environmental justice.

**Instructors:** Pavlos Stavropoulos, Louise Benally, Robert Chanate, and special guests.

**Cost:** \$1,100 by 5/31, \$1,200 by 7/31, \$1,300 after.

**Contact:** Woodbine Ecology Center, P.O. Box 1253, Littleton, CO 80160  
pdc@woodbinecenter.org      www.woodbinecenter.org/pdc2011

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## Permaculture Design Course

Northern California

**Dates:** October 2011-September 2012

**Location:** Bolinas, CA

**Description:** This course is a great opportunity to take a permaculture design course over a full year of nature's rhythms. You will learn how to observe and use the same principles that make ecological systems self-sustaining, and apply them to integrated homes and gardens. In addition, you will learn how to apply these principles to energy systems and water supplies, healthy communities, meaningful and fulfilling work, ecological economies, and global political movements for change. The four-season format also allows you the opportunity to implement permaculture principles at home and bring your experiences and questions back to the class for feedback and discussions.

**Instructors:** Penny Livingston-Stark, Lydia Neilson, Lauren Dalberth, David Hage, John Valenzuela, and special guests.

**Cost:** \$1,100; \$975 if paid in full by September 9

**Contact:** Regenerative Design Institute  
415-868-9681  
info@regenerativedesign.org

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## 25th Annual Permaculture Design Course

Rocky Mountains

**Dates:** August 1-13

**Location:** Basalt, CO

**Description:** Participate in the 25th annual permaculture design course at CRMPI! Study permaculture with a renowned group of teachers imbuing their teaching with rich depths of permaculture experience stretching across the continent and through time. Engage in practical work that you can implement in your own designed systems as well as participate in engaging discussions leading to new practice.

**Instructors:** Peter Bane, Jerome Osentowski, Kelly Simmons, and Adam Brock.

**Cost:** \$1,475; discount for couples

**Contact:** Jerome Osentowski  
CRMPI  
970-927-4158  
jerome@crmpi.org

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## Permaculture Design Course

Southern Indiana

**Dates:** Sept. 30-Oct. 1; 14-16, 28-30;  
Nov. 11-12, 18-19

**Location:** Bloomington, IN

**Description:** Immerse yourself in permaculture education, design, and projects over five weekends. Learn the skills needed to take responsibility for your home, your life, your community in a way that builds awareness, resilience, and joy. Instructors combine years of practical experience in permaculture systems of all kinds with innovation necessary for our rapidly changing lives. Leave this course ready to delve into the work of a lifetime.

**Instructors:** Rhonda Baird, Peter Bane, Keith Johnson, and guests.

**Cost:** \$850; some work-trade avail.

**Contact:** Rhonda Baird  
812-323-1058  
rk.baird@yahoo.com  
www.shelteringhills.net

## Permaculture Design Course

Wabash Valley

**Dates:** 10 weeks September-December

**Location:** Bloomington, IN

**Description:** Incorporate your permaculture design course into a larger path of learning through the Wilderness Immersion and Leadership Development program. This is sure to be a memorable and life-moving experience as you spend ten weeks learning and living the skills of nature-connection, wilderness survival, outer and inner awareness, and leadership. This program will greatly expand your skill-set in living close to the earth and strengthen your abilities as a teacher/mentor of those skills. The curriculum includes The Art of Mentoring, Wilderness Survival Skills, Tracking and Awareness, Edible and Medicinal Wild Plants, Permaculture Design, Nature Connection, Health and Vitality. The program will weave together the full permaculture design course with daily and weekly practices that lead to a richer, more fulfilling life and community.

**Instructors:** Rhonda Baird, Kevin Glenn, Monique Philpot, Mark Morey, Evan McGown, Dr. Randall Eaton, and guests.

**Cost:** \$3,150 tuition only.

**Contact:** Kevin Glenn  
WILD Nature Project  
812-361-3471  
kevin@wildnatureproject.com  
www.wildnatureproject.com/wildimmersion.html

# Back Issues of *The Permaculture Activist*

- I,1 July '85 **Permaculture in Oz** I,2 Nov. '85 **Fruit & Nut Trees**  
II,1 Feb. '86 **Garden Design** II,2 May '86 **IPC-2 & Pc Courses**  
II,3 Aug. '86 **2nd Int'l Pc Conference**  
II,4 Nov. '86 Fukuoka, Keyline, Genetic Conservation, City Farms, Oceanic Pc  
III,1 Feb. '87 Networking, Natural Farming, D-Q Univ., Children's Permaculture  
III,2 May '87 **Wild Land Restoration** III,3 Aug. '87 **Annual Planting Cycle**  
III,4 Nov. '87 **Trees for Life** IV,1 Feb. '88 **Marketing Pc Products**  
IV,2 May. '88 **Urban-Rural Links**, Economics & Community Development  
IV,3 Aug. '88 **Social Forestry**, Gabions, Jap. Org. Ag., Producer/Consum. Coops  
IV,4 Nov. '88 **Multi-Story Tree Crops**, Greening Dominican Rep., Runoff Gdns  
V,1 Feb. '89 **Permaculture: A Designers Manual**, Tree Bank, Water in Pc  
V,2 May. '89 **Plant Guilds**, Roof Gardens, Small Livestock  
V,3 Aug. '89 **Rainforest Conservation** in Ecuador, Gaia, Weed Gardens  
V,4 Nov. '89 **Earthworks & Water Conservation**: Small Dams, Ponds, Keyline  
VI,1 Feb. '90 **Household Greywater** Systems, Soil Imprinting (\$5 each to here)  
VI,2 May. '90 **Insectary Plants**, more Greywater, Land Use for people  
VI,3 Aug. '90 **Water**: Forests & Atmosphere, Catchment, Pond Design  
VI,4 Nov. '90 **Urban Permaculture**: EcoCity Conf., Soil Detox, Suburbs & Pc  
#23 May '91 **Politics of Diversity**, Greenhouse Market Gdn, Pc in Nepal  
#24 Oct. '91 **Creativity in Design**: Case Studies; **Index to Issues #1-23**  
#25 Dec. '91 **Design for Community**: CSAs Restoring Forests; Garden Ecology  
#26\*May '92 **Soil**: Our Past, Our Future; Fertility, Worms, Cover Crops  
#27\*Aug '92 **Integrating Pc**: Deconstructing Utopia, Grassroots Organizing, Garden Polyculture, Pattern Learning, Living Fences  
#28\*Feb. '93 **Structures**: Comm'ty Dsgn, LETS, Industry, Strawbale/Timber-frame Bldgs.  
#29/30\* Jul. '93 **Networks**: Media Revw, Rural Reconstruction, Leaf Concentrate, Comm'ty Food Inits, Palestine Pc, Do-Nothing Educ, Feng Shui, Pc Academy  
#31\*May '94 **Forest Gdng**: Energy & Pc, Mushrm Cultvn, Robt.Hart's F.G., Spp for No. Cal., Alders, Agroforestry in Belize & China, Honeylocust, N-fixers  
#32\*Apr. '95 **Animals & Aquaculture**: Animal Polyculture, Small-scale Cattle, Goat Dairy, Keyline, Feral chickens, Bee Plants, Constructed Wetlands  
#33 Dec. '95 **Cities & Their Regions**: Green Cities, L.A. Ecovillage, MAGIC Gdns, CoHousing, Micro-Enterprise Lending, Suburban Conversion  
#34 June '96 **Useful Plants**: Bamboo Polyculture, Medicinals, Pest Control, Root Crops, Oaks, R. Hart's F.G., Russian Plants, Regl. Plants, Sources  
#35 Nov. '96 **Village Design**: Pattern Language, Consensus Democracy, Conflict, Historic & New Villages, Planning for Tribe, Village Economics  
#36\*Mar. '97 **Climate & Microclimate**: Climate Change, Windbreaks, Low-Tech Sun Locator, Drylands, Cool Slopes, Straw-Clay Bldg. Round Beehive, Water Catch.  
#37 Sept. '97 **Tools & Appropriate Technology**: Dowsing, Workbikes, Scythes, Japanese Saws, Nursery, Ferrocement, Greywater, A-frame & Bunyip Levels, Ram Pump, Solar Toilet, Log Yoke, Cookstoves  
#38\*Feb. '98 **Economic Transformation**: Speculation, No Middle Class, Coops WWOOF, Global Warm'g, Hol. Fin. Plan'g. Land Use, Adopt-a-Hive  
#39 Jul. '98 **Knowledge, Pattern & Design**: Pc Way of Seeing; Native Consvn Sand Dunes, Language-Worldview-Gender, Patterning Process, Land-Use Planning, Teaching Pc, Vietnam, Holmgren on Pc  
#40\*Dec. '98 **New Forestry**: Regl. Devl., Horseslogging, Menominee Reservation, Forest Investing, Restoration, Old Growth, Homestead Tenure, Forest Soils, Forest Farming, Woody Agric., Rainforests, Windbreaks, Coppice  
#41\*May '99 **Natural Building**: Oregon Cob, Cordwood, Bamboo, Thatch, Ethics, High Winds, Origins of Conflict, Greenhouses, Ponds, Adobe, Road Bldg, MicroHydro, Bldgs. That Live, Under \$20K Houses, Dreams  
#42 Dec. '99 **Self-Reliance & Community Cooperation**: Co-Intelligence & Self-Orgn., Archetype Design, Sovereignty, Samoa, Mondragon, Natural Hous'g, Comm. Gdns., Zone Zero, Solar Electric Tractor, Beekeeping  
#43\*June '00 **Food & Fiber**: Hunger, Ferments, Seasonal Salad, Heirlooms, Fencing Self-Fertile Gdns, Rice Revolt'n, Cold-Climate Food, Edible Insects, Chilies, Food Origins, Garlic, Ethnobotany, Wild Food, Bamboo, Hemp  
#44 Nov. '00 **Earthworks & Energy**: Spreader Drain, Horse Swales, Earth Dams, Machinery, Carpet-lined Ponds, Constr. Wetlands, Biogas, Windmills  
#45 Mar. '01 **Medicine & Health**: World & Self, Healthy Home, Designing Care, Ayurveda, Agents of Decay, Comm. Health Centres, Women Trad. Med. 4th World Apothecary, Healing Weeds, Medicinal Crops, Hawaiian Bot'ls  
#46 July '01 **Good Work & Right Livelihood**: Pc Golf Course, Downsize Cost of Living, New Forest Economy, Energy Currency, Buddhist Mktg, End Wage Slavery, What's Surplus?, Urban Community, Enterprise Facil'n  
#47 June '02 **Watersheds**: Water4Sale, Basins o'Relations, Watershed Devl, Gabions, Urban Runoff, Beavers, Skywater Ctr, Consvn. Investmt, Peat Bogs, Rabbits  
#48\*Sept '02 **Making Changes**: Co-Intelligent Activism, Webs of Power, Urban Food, How to Change, Teaching for Change, Global Transform'n, City Repair, Escaping Job Trap, Argentine Recovery, Costa Rica Pc  
#49 Dec. '02 **Where is Permaculture?** Land-Rent Reform, 10 N. Amer. Sites, Cuban Ag, Rainbow Vall. NZ, Cacti/Succulents, Animal Self-Meds, Challenge to Pc  
#50 May '03 **Ecosystems**: Holmgren on Pc Mvmt, Hazelip & Syng. Ag, Chestnuts/Pigeons, Oak Savannas, Root Crop Polycultures, Alders, Fungal Ecosys. Humans & Wilderness, Indoor Ecosystems, Humid Tropics  
#51 Jan '04 **Trad'l. Knowledge & Regeneration**: Cataclysm & Collective Memory Genome Wisdom, *Waru Waru*, Biosculpture, Inuit Medc, Ferment'd Stimulants  
#52 May '04 **Aquaculture**: EcoAquac, Fish4Health, Dowsing, Pond Design, Greywater Biotreatment, N. Amer. Polyculture, Manage for Native Spp, Integrated Village Fisheries, Vietnam

## Permaculture Design Course Central Maine

**Dates:** September 25-October 1

**Location:** Auburn, ME

**Description:** Miel Farm and Apiary invites you to join us for a permaculture design course from the biodynamic farming perspective with Mark Shephard. The setting will be a 104-acre farm. We believe that if biodynamic farmers apply the knowledge and insight taught by anthroposophy and create an individualized farm organism they can also realize permaculture. During the week we will be exploring how these complementary systems can be applied in a farm-scale setting.

**Instructors:** Mark Shephard

Luis G. Feliciano

**Cost:** \$1,195

**Contact:** Luis G. Feliciano

207-786-9796/luis@mielfarm.com

www.mielfarm.com

## Permaculture Design Course Mid-Atlantic

**Dates:** Sept. 10-11, Oct. 1-2, Nov. 5-6,  
Mar. 3-4, Mar. 31-Apr. 1,  
Apr. 28-29.

**Location:** Freeland, MD

**Description:** Join us for a course exploring the design methodology which mimics universal patterns found in nature to create healthy human communities. This course will take place at Heathcote, an intentional community located near Baltimore. Situated on over 100 acres, this course lives the experience of permaculture potential.

**Instructors:** Patty Ceglia, Karen Stupski

**Cost:** \$800-\$1,000

**Contact:** Karen Stupski

410-357-9523

education@heathcote.org

## Permaculture Design Course Mid-Atlantic

**Dates:** August 18-28

**Location:** Victoria, VA

**Description:** This course will cover the core topics of permaculture and regenerative design with an emphasis on temperate climate design applications. The curriculum will include hands-on exercises and field trips. The design of this woodlands site will include demonstration gardens, a food forest, and botanical sanctuaries.

**Instructors:** Cliff Davis, Matthew English,  
and Marjani Dele

**Cost:** \$1,000 incl. camping & potluck  
dinners. Scholarships available.

**Contact:** Marjani Dele, 434-696-2439

marjani.dele@gmail.com

www.naturesfriends.org

## Back Issues of *The Permaculture Activist* (continued)

- #53 Aug. '04 **Education:** Lifelong Learning, Edge-ucation, Albany Free School, Indigenous Ed. & Ecology, Ecocentric Pedagogy, School Gardens & Dances, Ecology of Learning, Brain Gym
- #54 Nov. '04 **Fire & Catastrophe:** Design Beyond Disaster; New Opportunities; Globalization; Invasion Biology; Street Orchards; Community Food Security, Floodwaters Rising, Disrupted Climates
- #55 Feb. '05 **Learning from Our Mistakes:** Petrol Dependency, Village Design, Austral. Lessons, RTFM!, Trial&Error, Forestry Expmts, Owner-Bldr, 10 Mistaken Ideas in Pc
- #56 May '05 **Tree Crops & Guilds:** Pine Nuts, Tree Vege, Acorns, Am. Chestnut, Honeylocust Silvopasture, Broadscale AgroFor, Bamboo, Willow, Socl. For.
- #57 Aug. '05 **20th Anniv.:** Challenges & Changes, USA Pc, Hawai'i Retrospect; Permaculture; Pc's Soft Edge; Gaia U; PINC; Oil Depl; IPC-7; Retrofit Suburbs
- #58 Nov. '05 **Urban Pc:** Urban/Rural Futures; City Zones & Sectors; Growing Food; Detroit Visionaries; Reblgd. New Orleans & Everywhere; Transforming a Military Base; Workers Co-op; Energy Descent.
- #59 Feb. '06 **Peak Oil:** Eco-Collapse & Trauma; Thom Hartmann; Pathways for Energy Descent; How Cuba Survived; Oil & Food; Biofuels; Algae for Fuel; Relocalize!
- #60 May '06 **Land Use Past & Present:** Sust.Ag an Oxymoron?, Negev Bedouin, East. Woodlands AgroForestry, Pc Heals in India, Arocanti Land Plan, Pop. Growth/Land Hunger, Mex. Reforestation, Rocky Mtns.
- #61 Aug. '06 **Unseen Kin-doms:** Observation as Design Tool; Soil Food Web, Bees, Mycelial Internet, D-I-Y Mycorrhizal Inoculum, Cover Crops as Bee Forage, Earth Energies, Local Currencies, Dead Zones, Birds at Risk
- #62 Nov. '06 **Art of Permaculture:** Painting, Writing & Pc; Ecoartists; Art, Activism & Cmty; Street Theatre; Art & Bioremediation; Living Willow, Body as Zone 0; Art of the Found; Water Magic; Pc in Pop Culture
- #63 Feb. '07 **Building & Technology:** How to Dwell? Natural Bldg & the Law, Bldg Code, Strawbale in China, Cob in Armenia, Integrated Solar Heating, Cooking, Pumping; Self-Build, Nation-Scale Pc in Brazil
- #64 May '07 **Waste = Food:** Throwaway Econ, Strategy of Salvage, Peak Soil, Pigs & Waste Mgmt; Bikes, Soil & Garbage; Farm as Organism, Opportunistic Plants? Simple Biodigester, Waters of Spain, Vermiculture
- #65 Aug. '07 **Climate Change:** Shrinking Seas, Forests' Role in Climate, Urban Forests, Making Trees Pay, Rainwater Harvst'g, Indoor Gdns, Water Filtration, Changing Human Climate, De-Stabilizing Climate
- #66 Nov. '07 **Animals in Design:** Jumbo Shrimp, Pawpaw Patch, Alpaca, Insects as Food, Bees, Integrated NH Farm, Pastured Poultry & Rabbits, Urban Livestock, Predator Restoration, Complementary Animals, Agrichar
- #67 Feb. '08 **Kids in Pc:** School as Ecosystem, Pc Education, Pc to H.S. Students, Tlaxcalan Kids Make Seedballs, Gardening Kids, Fostering Research Skills, Bottled Water Boycotts, Feeding 8 Billion
- #68 May '08 **Plants on the Move:** Rethinking Non-Natives, Forest Migration, Black Walnuts, Saving Seed Savers, Grow a Cmty. Gdn, Neighborhood Greening, Healthy Honeybees, Biofuels & High Food Prices
- #69 Aug. '08 **Permaculture at Home:** Hawai'ian Cmty; London Forest Gdn; Suburban Renaissance; Calif. Campus; Phila. Orchards; Drinking Roofwater; Floating Island Bioremed.; Bike Transport; Mississippi Pc
- #70 Nov. '08 **Ethics at Work:** BAU is the Enemy; 13 Princ. of People Care; Pc in Business; Ecovillages; White Man in India; Uganda Boarding School, No Waste Principle; Qual. Control; City Farming w/Runoff; Amaranth
- #71 Feb. '09 **Working w/Earth:** Hopewell Mound Water Mgmt, Belize, Road & Dam Bldg, Keyline, NW AgroFor, Pc&Landscape Arch, Earthbag Bldg, Low-Watt Fridge
- #72 May '09 **The View from Abroad:** War, Oil & Snails in Nigeria; Green Tech Future, Ethiopian Water Mgmt.; Shrinking Forests; Food Exploration in Caucasus; Maya Agroforestry/Biochar; Pc to Trinidad; Bridging Cultures in Brazil & India, Pc Schools in Africa; BuggerBug in Liberia
- #73 Aug. '09 **Bioregionalism:** New Paradigm; Rocky Mtn. Wildlands; Wild Elephants; Organizing Houston; Heirloom Seeds; L.A. Gdns; Reclaiming Commons; Transition Hohenwald, Tenn.; BioCongress Saga; Diversity at Home
- #74 Nov. '09 **Energy Descent:** In the Home; Transition Communities; Pc in Mexico; Biochar; US Consumption Dropping; Making Fuel Alcohol No More Throwaway Economy; EcoTechnic Future
- #75 Feb. '10 **Local Food:** A City & Regl. Food System; Working Family on 5Ac; CSAs & Wild Foraging, City Backdy Gdng.; Food Bank Gardens & Orchards; Salt Collecting; Growing Regional Staples; City Grains.
- #76 May '10 **Soil Fertility:** Permaculture Way of Soil; Biochar; Sheet Mulch; Hawai'ian Soil Farming w/ Worms; Demystifying Humanure; Urine Fertilizer; Crop Rotations; Mushrooms Build Soil
- #77 Aug. '10 **Eco-Nomics:** Measuring Many Forms of Capital & Quality of Life; Bob Swann & Invisible Structures; Bioshelter Market Garden; Green Collar Economy; Pc & Finance; Pc Inst., Cert. & Diplomas
- #78 Nov. '10 **Water Wise:** Restoration Engineering; Watershed Relations; Colorado Runoff Gdns; Cisterns in Saudi Arabia; Energy Use & Water; Trad'l. Mexican Catchment; Rooftop Garden; Home Water Conservation; Making Swampy Land Productive; Sunken Gdns in Nigeria
- #79 Feb. '11 **The Urban Frontier:** Indoor Denver Farm; Rooftop Food; Return to Your Hometown; Urban Ecovillage; City Bees; Urban Pc Projects Start Pc Farming; Mark Shephard; Index to *PcActivist* issues 24-40.
- #80 May '11 **Designing for Disaster:** Collapse Mitigation; Global Storming; Responding to Major Events; Stabilizing the Climate; Self-Care in a Disastrous World; Ensuring Food Supplies; Living through Drought

### Back Issue Prices & Ordering

\$6 each ppd\* • 20% discount on 5+ • Complete Set \$390^^

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\*except the following: Vol. I, I-VI, 2 & #33-35 - \$5 each; #26-32 & 36, 41, 48 - \$8 ea; #38, 40, 43 - \$10 each. ^^Can/Mex. +\$45, Overseas +\$80

## Advanced Permaculture Design Southeast US

**Dates:** September 23-October 2

**Location:** Summertown, TN

**Description:** In this nine-day intensive course, you will dive deeply into the vision, theory, and practice of designing wholesome, dynamic, and resilient edible ecosystems using temperate deciduous forests as models. Lectures, site walks, and experiential exercises will help you understand how the architecture, social structure, underground economics, and successional processes of natural forests apply in the design of edible ecosystems of all kinds.

**Instructors:** Dave Jacke and guests

**Cost:** \$1,100-\$1,400 sliding scale

**Contact:** 931-964-2375

spiralridgepermaculture@gmail.com

www.spiralridgepermaculture.com

## Permaculture Design Course Southeast US

**Dates:** October 15-22

**Location:** Koinonia Farm, Americus, GA

**Description:** Come and learn with us in the rural setting of this 70-year-old intentional community. The course runs Saturday through Saturday and includes required pre-course study materials that must be completed prior to attending classes. Topics include design principles, pattern understanding, aquaculture, homestead planning, farm/garden management and marketing, practical design work, and much more. This is a full design course. Stay October 23-26 for an additional Natural Building Workshop.

**Instructors:** Wayne Weiseman  
and special guests.

**Cost:** \$1,100 for PDC only, \$500 for Natural Building Workshop, \$1,300 for both. Tuition includes lodging and all meals. Discounts available.

**Contact:** Sarah Prendergast  
229-924-0391

sarah@koinoniapartners.org

koinoniapartners.org/ministries/schedule.html

## Quick-Start Booklet Series

\$7 each postage paid, \$25 for all 4.

- *Water in the Home Landscape*
- *Building Living Soil*
- *Beekeeping Simplified*
- *Wild Fermentation*

Compiled by the PcActivist and chock-full of information from the best minds in Pc.

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# Calendar

**August 1-13. CRMPI, Basalt, CO. Permaculture Design Course.** Jerome Osentowski, 970-927-4185. jerome@crmpi.org. www.crmpi.org.

**August 7-13. Cottage Grove, OR. 11th Annual Advanced Permaculture Teacher Course.** cascadiapc@gmail.com. www.cascadiapermaculture.com.

**August 8-26. Corvallis, OR. Permaculture Design Course.** 541-752-9118. amillison@gmail.com.

**August 10-14. Ashland, OR. Permaculture Teacher Training.** Chuck Burr, 541-941-9711. courses@sopermaculture.org. www.sopermaculture.org.

**August 14-27. Winlaw, BC, CANADA. Permaculture Design Course.** Gregoire Lamoureux. 250-226-7302. spiralfarm.yahoo.com. http://www3.telus.net/permaculture.

**August 15-September 2. Corvallis, OR. Permaculture Design Course.** www.beaverstatepermaculture.com.

**August 18-28. Victoria, VA. Permaculture Design Course.** Marjani Dele. 434-696-2439. marjani.dele@gmail.com. naturesfriends.org.

**August 19-17. Klamath, OR. Continental Bioregional Congress.** biocongress.org.

**August 19-21. Mount Vernon, WA. Northwest Herbal Fair.** www.nwhearbalfair.com.

**August 20-21. Regenerative Design Institute, Bolinas, CA. Water in the Sustainable Landscape.** 415-868-9681. info@regenerativedesign.org.

**August 22-29. Ashland, OR. Edible Forest Garden Design.** Chuck Burr, 541-941-9711. courses@sopermaculture.org. www.sopermaculture.org.

**August 28-September 9. Kootenay Lake, BC, CANADA. Permaculture Design Course.** Susan, 250-366-4395, 250-352-3449, susangrimble@telus.net. http://willowwaywellness.com/blog/2010/11/kootenay-permaculture-design-course/

**September-December. Bloomington, IN. Wilderness Immersion and Leadership Development Program includes Permaculture Design Course, Art of Mentoring, Nature Connection, and Wilderness Survival Skills.** Kevin Glenn, 812-361-3471. kevin@wildnatureproject.com. www.wildnatureproject.com/wildimmersion.html.

**September 2011-February 2012. Tacoma, WA. Permaculture Design Course** over eight weekends. sustainableatacomapierce@gmail.com. divinearthgp.com

**September 2011-May 2012. Commonweal Garden, Bolinas, CA. Regenerative Design Nature Awareness. Regenerative Design Institute.** 415-868-9681. info@regenerativedesign.org. www.regenerativedesign.org.

**September 2-17. Regenerative Design**

**Institute, Bolinas, CA. Permaculture Design Course.** 415-868-9681. info@regenerativedesign.org.

**September 8-11. CRMPI, Basalt, CO. Forest Garden Intensive.** Jerome Osentowski. 970-927-4158. jerome@crmpi.org. www.crmpi.org.

**September 8-23. Sandpoint, ID. Permaculture Design Course.** www.gentleharvest.org/events.shtml.

**September 9-11, September 23-25. Little Applegate, OR. Optical Surveying for Earthworks and Water.** Tom Ward, Siskiyou Permaculture. 541-482-7909. www.siskiyoupermaculture.com.

**September 9-22. Sedalia, CO. Edible Forest Gardens.** info@woodbinecenter.org.

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**September 10-11, October 1-2, November 5-6, March 3-4, March 31-April 1, April 28-29. Heathcote, Freeland, MD. Permaculture Design Course.** Karen Stupski. 410-357-9523. education@heathcote.org.

**September 12-October 21. Nelson, BC, CANADA. Permaculture Training Program.** 250-226-7302 spiralfarm@yahoo.com. www3.telus.net/permaculture.

**September 15-18. CRMPI, Basalt, CO. Greenhouse Intensive.** Jerome Osentowski. 970-927-4158. jerome@crmpi.org. www.crmpi.org.

**September 17-September 30. Occidental, CA. Permaculture Design Course.** 707-874-1557 x201. www.oaec.org.

**September 23-October 2. Summertown, TN. Edible Ecosystems Emerging.** 931-964-2375. spiralridgepermaculture@gmail.com. spiralridgepermaculture.com.

**September 25. Denver, CO. Colorado Permaculture Convergence.** Colorado Permaculture Guild. 303-918-0460. guild@coloradopermaculture.com.

**September 25-October 1. Auburn, ME. Permaculture Design Course.** 207-786-9796. luis@mielfarm.com.

**September 28-October 1, 14-16, 28-30, November 11-13, 18-20. Bloomington, IN. Permaculture Design Course.** Rhonda Baird. 812-323-1058. rk.baird@yahoo.com.

**October 2011-September 2012. Regenerative Design Institute, Bolinas, CA. Permaculture Design Course.** 415-868-9681. info@regenerativedesign.org.

**October 7-9. Occidental, CA. Edible Forest Garden Design.** Occidental Arts and Ecology Center. 707-874-1557 x201. www.oaec.org.

**October 21-23, November 11-13. Little Applegate, OR. Social Forestry.** 541-482-7909. siskiyoupermaculture.com.

**October 13-16. St. Helens, OR. Northwest Permaculture Convergence.** www.nwpermaculture.com.

**October 14-23. Summertown, TN. Edible Forest Garden Design Intensive.** www.spiralridgepermaculture.com.

**October 15-22. Americus GA. Permaculture Design Course.** Sarah Prendergast. 229-924-0391. sarah@koinoniapartners.org. <http://koinoniapartners.org/ministries/schedule.html>.  
**October 23-26. Americus GA. Natural Building Workshop.** Sarah Prendergast. 229-924-0391. sarah@koinoniapartners.org. <http://koinoniapartners.org/ministries/schedule.html>.  
**October 31-November 13. Quail Springs,**

**CA. Permaculture Design Course.** info@quailsprings.org.  
**November 4-6. Spokane, WA. Inland Northwest Permaculture Conference.** www.inlandnorthwestpermaculture.com.  
**November 4-13. TRINIDAD. Permaculture Design Course.** wasamakipermaculture.org.  
**December 1-14. Lost Valley Education Center, Dexter, OR. Permaculture Design**

**Course.** Marisha Auerbach. 360-273-7117. queenbee@herbnwisdom.com.  
**January 7-21. Cazadero, CA. Earth Activist Training.** 800-381-7940. earthactivisttraining@gmail.com. www.earthactivisttraining.org.  
**February 11-March 18, 2012, weekends. Ashland, OR. Permaculture Design Course.** Chuck Burr. 541-201-2688. courses@sopermaculture.org. www.sopermaculture.org.

## LETTERBOX



### Solutions for Disaster

To the editor,

I received the latest issue of the *Permaculture Activist* (#80) yesterday and found the content quite stimulating in various ways. The excerpt from Dmitry Orlov's book ("Mitigating Collapse") left me less than impressed. This is my first encounter with anything he has written, although I gather from a quick online search that he is quite active in the blogosphere and other venues. Even though he had a lot to say in a critical sense about our current situation, I felt that he was very short on solutions. This might be unfair since this was only an excerpt from a longer book, but what was offered in the piece felt "virtual" to me.

In particular, I found myself thinking last evening about one story he offered in the article as an example of a reason

to distrust "activists." His narration of the problem between community garden members wanting more participation and the Russian members who are shy of group involvements left me wondering why he did not try to offer his help with bridging this particular cultural gap. Given his understanding of both American and Russian culture, he could have played a valuable role in resolving the problem. His negative reaction seemed essentially passive and off the mark. In my days as a farmers' market manager, I had to deal with similar situations. The insights of other participants in the market were always welcome toward reaching solutions.

However, I do not have the same feeling about most of the rest of this issue's contents. Practical problem-solving and solutions seemed to be the dominant theme of the main articles. I got a lot of food for thought from them. Having experienced the 1964 Alaskan earthquake as a teenager, I can resonate with the need to think ahead and outside of the box when it comes to coping with the unexpected. I also really enjoyed Eric Toensmeier's thoughts on permanent agriculture (looking forward to his next article) and the review of Sepp Holzer's *Permaculture*, which I was curious about after I saw a brief mention of it elsewhere.

Speaking of solutions, Rhonda Baird mentioned in her article her concern about buying seaweed products from Japan.

I want to let her and the *Permaculture Activist* community know that there is a great source for them here in the U.S. Larch Hanson, who harvests seaweed in Maine, sells directly to the public through his website and also takes orders by phone and mail. His contact information is [www.theseaweedman.com](http://www.theseaweedman.com) or 207-546-2875. You can also contact him at hanson.larch@gmail.com with any questions. Larch is an amazing person and a real inspiration to anyone who is interested in a meaningful and self-sufficient life.

I appreciate the good work all of you do.

Catherine Nicosia  
 Washburn, MO

### Seeds for the Future

To the editor,

I came across an old issue of your magazine and thought to drop you a line on a couple of projects that would be interesting for your readership.

I'm a listed member of Seed Savers Exchange, co-curator of potato crop, and working on finding the best potato varieties to increase yields by growing vertically—optimizing growth in small gardens.

The latest potato breeders' creations feature tuber uniformity, short stolons, easy to harvest by machine (good for larger farming and not for the pleasure of gardeners). You can find more at [www.kenoshapotato.com](http://www.kenoshapotato.com).

The second project I'm working on is growing out F2 squash featuring "naked seed" with high protein content and edible flesh. We are still looking for participants to help with both projects.

Curzio Caravati  
 403 - 8th St  
 Kenosha, WI 53140

*Letters continued on page 64*

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## Reading the Landscape

To the editor,

Thanks for all your valuable work in the permaculture field. I appreciate reading Peter Bane's writing. In the Autumn 2010 issue of the magazine, "Economics," the book review entitled "Telling an Ancient Story"—which reviewed Patrick Whitefield's *The Living Landscape*—Peter wrote he "doubt[ed] we will see anything like it written for our continental-scale nations on this side of the pond any time soon, but there are valuable regional and topical guides to reading landscape." (p. 57).

I can't help but wonder have you read Tom Wessel's *Reading the Forested Landscape*? This book is a valuable tool for the Northeast region of the continental U.S.

Thanks again for your work.

Jessica Rubin  
Montpelier, VT

## More sustainable butchering?

They are trying to get a meat packing plant in the village of Liberty in Sullivan County, NY. I read an article about it today and it seems to me that the expense involved in what they are planning is ridiculous. That got me to wondering if anyone in the permaculture movement has designed a composting method to deal with the waste products of animal butchering? If any of you have any ideas, would you please get back to me? It seems to me that we should be able to turn such waste

into fertilizer, etc.

Rosa Lee  
417 Rock Hill Dr, Rock Hill, NY 12775  
erewhon@earthlink.net

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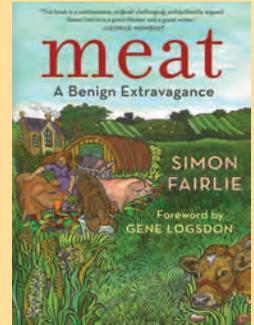
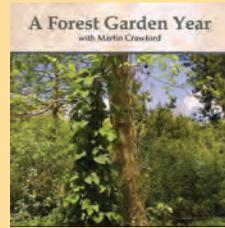
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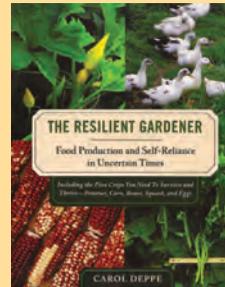
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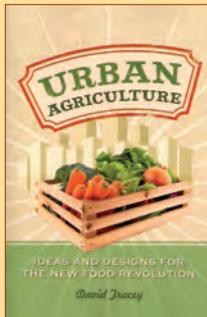


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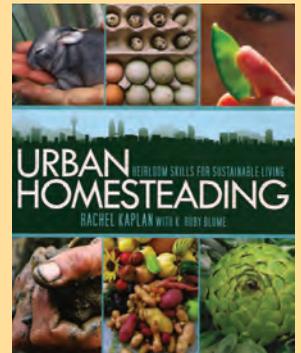


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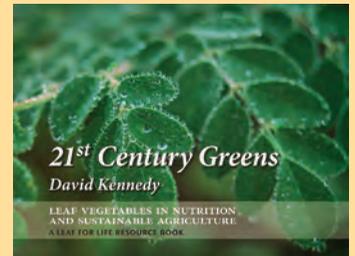
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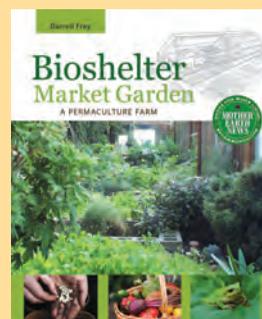
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