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DEAR ORGANIC GARDENERS,

http://www.seedsofchange.com/enewsletter/issue_64/dear_gardeners.asp

It is a cold drizzly day here in Maine as I write this—much like the day a year ago when I had the good fortune to tour the Seven Seeds Farm with Don Tipping. Don and his wife Kimberly farm about ten acres in Southern Oregon, tucked against the foothills of the Siskiyous. They have developed one of the most sustainability-minded and low-input farming operations I've seen over my many years of visiting Seeds of Change seed growers. Don has built his strategy around both his extensive permaculture experience and his knowledge of biodynamic agriculture. Despite the weather, we were able to trek through his fields where row crops mingle with various perennial food, fodder and nitrogen fixing plants and integrate with flocks of chickens, geese and sheep. The only weak link I could see in the true sustainability of the operation was that he still had to run his small combustion engine-driven tractor to accomplish a lot of the work around the farm.

After a morning of walking, talking and photographing, the rain abated and we settled in to thresh some leek seeds that were still embedded in their beautiful spherical flower tops that were now dried and brittle. Having spent years threshing seed by hand, Don was eager to show me his recently purchased PTO- ("power take-off" from a tractor) driven thresher that would make quick work of the VW Bug-sized pile. After a few photographs I helped Don and his son Wally feed the machine, stopping occasionally for more pictures as the threshed seeds emerged. While we worked away on the pile of seed-laden flowers I began to develop an appetite spurred on by the smell of food cooking nearby (we were just a few yards away from the house). With the thought of a hearty farm-house lunch in my head we worked away at the pile.

It took a few minutes to realize that, no, Kimberly had not returned to cook us lunch, but rather I was smelling the used cooking oil that Don burns in his tractor in lieu of fossil fuel. So much for the "weak link" in his sustainability strategy! My interview with Don and accompanying photo-essay is below. After spreading the seeds on screens for a final drying we sat down for a delicious homegrown lunch of beans and cornbread.

I've been a committed organic gardener and supporter of organic farming for decades, but recently I've come to realize that organic is only the beginning of how we need to focus our agricultural enterprises to be as sustainable and environmentally conscious as they can be. Two of the great issues of our day surrounding agriculture are inter-related: carbon emissions and localizing our food supply. In addition to our regular Farm Report and News & Views, this edition of the Cutting Edge examines these two issues in some depth. First time Cutting Edge writer Wade Collins delves into how farming can work to sequester carbon in soil, thus keeping it out of the atmosphere where it contributes to global warming.

Growing food close to home is of course another way to fight global warming by keeping fossil fuel-guzzling, carbon spewing, refrigerated tractor-trailers off the highways. Kelle Carter reports on a trip that she and I took

to visit New York City's burgeoning urban farming movement that provides fresh, flavorful, culturally appropriate food (and a host of other benefits) to communities where it is needed most.

As you slide out of the gardening season and into the days of garden dreaming and planning, I hope you find some inspiration in these words and pictures. The time has come to move beyond organics and work together to develop gardening and farming practices that are an integral part of a sustainable food future

Enjoy, Dream, and Act,

Scott Vlaun

Editor

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**CARBON SEQUESTRATION:
AGRICULTURE'S NEXT REVOLUTION**

by Wade Collins

http://www.seedsofchange.com/enewsletter/issue_64/carbon.asp

By now, hopefully, all of us have come to understand the magnitude of the threat that global climate change poses to the health of our planet. The "warming of the climate system is unequivocal," states the latest IPCC (Intergovernmental Panel on Climate Change) report issued in February of this year, "as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising average sea level" (IPCC 2007). Temperatures around the world have been documented to have already risen 0.76 degrees Celsius since the beginning of the 19th century, and current atmospheric modeling of global temperatures predicts a further increase of between 1.8 and 4.0 degrees Celsius by the end of the 21st century if emissions of CO2 and other greenhouse gases are not immediately and severely curtailed.

These increases in temperature portend a future that is difficult to comprehend, and chilling in its implications. A six foot rise in sea levels, for instance, would completely inundate countless coastal communities around the world. "The consequences would be catastrophic," says Jonathan Overpeck, director of the Institute for the Study of Planet Earth at the University of Arizona in Tucson in a 2004 National Geographic News article. "Even with a small sea level rise, we're going to destroy whole nations and their cultures that have existed for thousands of years" (Lovgren 2004).

So, global warming is real, is happening right now, and is, unfortunately, going to get much worse. How much worse? This is up to us and we all have a moral imperative to do whatever we can, as a species, as a community, as individuals, to prevent the worst case scenarios from becoming our and our children's reality.

There are certainly ways each of us can help reduce the impact and severity of global warming. Of course, we can reduce our dependence on fossil fuels, drive less, do a home energy audit, replace energy inefficient appliances and convert to clean energy sources. By doing so we can limit the amount of new carbon dioxide being released as a result of anthropogenic (human created) means. But what, if anything, can be done about the carbon dioxide that is already here with us now, and additionally, that which is going to be emitted tomorrow and on into the foreseeable future? ("Both past and future anthropogenic carbon dioxide emissions will continue to contribute to warming and sea level rise for more than a millennium, due to the timescales required for removal of this gas from the atmosphere" (IPCC 2007).

As it turns out, one of the best ways to remove CO2 from the atmosphere is to do something which many of you reading this article have already been doing: farming and gardening organically (Hepperly 2003). To be truly effective at removing atmospheric CO2, our agriculture needs to be more than simply organic, it must also be

sustainable, and perhaps most importantly of all, it must disturb the soil as little as possible. To understand this better it is important to first take a closer look at the C of CO₂.

Carbon is the fourth most abundant chemical element in the universe after hydrogen, helium, and oxygen. It constitutes 18.6% of our body mass, is present in every organic molecule in the human body, and “is the basis of the chemistry of all known life” (Wikipedia).

Carbon is neither created nor destroyed; it is cycled. That is, it moves between a finite number of dynamic storage environments within the Earth’s various ecosystems: the atmosphere, the oceans, the soil, living organisms, and that which is located within fossil fuel reserves. While carbon ebbs and flows amongst and between these “eco-islands,” the process that is most pertinent to the discussions centered around global warming is the one whereby carbon moves into, and out of, the Earth’s soil. Here, plants remove carbon dioxide from the atmosphere, breaking it apart during photosynthesis. The carbon generated as a result of this activity is used for growth and cellular development, while the oxygen, a waste product of plants, is returned to the atmosphere. When a plant dies and decomposes, it releases much of the carbon back to the atmosphere to recombine with oxygen in the form of carbon dioxide. A smaller portion of carbon, primarily that within the root structure of the plant, is stored in the soil in various stages of stability—that stability being dependent upon the activities of soil microorganisms that work to bind carbon within either physically or chemically protective bonds during the production of various humic substances, or SOM (soil organic matter.) This ability of plants to retain carbon in the soil via the production of organic matter that releases less carbon back to the atmosphere than they originally used is called sequestration, and it is one of the key elements for any plan hoping to address global climate change.

Let’s shift our focus to CO₂

Carbon dioxide is of critical importance in two very distinct ways. First and foremost, it is the substance that plants “breathe in” to enable photosynthesis. Without it there would be no plants, without plants there would be no oxygen, and without oxygen there would be no us. Although its disappearance would occasion no great outpouring of grief amongst the anaerobic crowd, as it was these frisky critters that ruled the earth before the advent of the oxygenated atmosphere (and to whom oxygen is a deadly toxin) we need carbon dioxide. That is, we need some carbon dioxide. A good round number would be, say, 280 ppm (parts per million), which is what was in the atmosphere at the end of the 19th century. 280 ppm also falls within the natural range of carbon dioxide (180 ppm to 300 ppm) that had existed during the previous 650,000 years. By contrast, in 2005, the atmospheric concentration of carbon dioxide had reached 379 ppm—well outside the established range—and was increasing, at that time, on average, another 1.9 ppm each year.

This brings us to the second point of critical importance regarding carbon dioxide: too much of a good thing, it turns out, isn’t such a good thing. Carbon dioxide, if it is not sequestered by plant material into the soil, or dissolved into solution within the oceans (it can remain intact for up to 200 years), accumulates. Some accumulation is okay and is necessary for life on earth to exist in its current climate habituations. This is because carbon dioxide, along with several other accumulative gases, traps a portion of the sun’s heat that is reflected off the earth’s surface. Without some accumulation of carbon dioxide the earth’s average temperature would be somewhere in the -18 degrees Celsius range instead of 15 degrees Celsius, which is what it is currently. But too much accumulation traps an excess amount of heat, warming the Earth’s various ecosystems into disruption.

There are two primary ways that carbon dioxide is released into the atmosphere, and therefore two different catch-points available to us to restrict that entry. The first, which accounts for over 70% of global CO₂ emissions, results from the burning of fossil fuels.

360 to 280 million years ago, during the Carboniferous Period, vast areas of green organic material were depos-

ited under successive layers of sediment. Over time, that organic residue, consisting largely of carbon, was subjected to enormous amounts of pressure and heat from the continuous and ever-intensifying weight of the earth, and eventually rock, blanketed over it. Through these processes coal, oil, and natural gas were created, forming huge repositories of stable carbon that remained, for all intents and purposes, locked away until their subsequent discovery as fuel and energy sources during the Industrial Revolution of the late 19th century. Burning these various fossil fuels over the last century and a half has released this formerly bound carbon, as carbon dioxide, into the atmosphere, transforming this ancient relic of the Paleozoic past into a monumental modern-day catastrophe.

Prior to the Industrial Revolution carbon dioxide was still being released into the atmosphere as part of the normal carbon cycle resulting from the decay of organic material, and also from volcanic activities. But there was another human-initiated technological revolution responsible for the bulk of carbon dioxide emissions not accounted for by future fossil fuel use, this one agricultural in nature.

The development of agriculture some 10,000 years ago initiated a series of land use practices that, while commonplace and widespread today, caused a significant shift in the equilibrium of the carbon cycle: specifically the clearing and burning of forests to accommodate an increased demand for areas under cultivation, and the exposure of subsurface organic matter to atmospheric conditions and erosion through increasing use of the plow. As the FAO (Food and Agriculture Organization of the United Nations) report entitled *Carbon Sequestration in Dryland Soils* points out, “the mold-board plow and disc harrow are believed to be the causes of the loss of soil C (carbon) through the destruction of soil aggregates and the acceleration of decomposition by the mixing of plant residues, oxygen, and microbial biomass” (FAO 2004). These activities allow for the release of carbon that would have otherwise remained in the various sequestration loops within the soil. That carbon, once allowed to re-enter the atmosphere, is free again to combine with oxygen to form carbon dioxide. To this day, agriculture remains a significant source of greenhouse gas emissions—roughly 30%—and certainly much more, if transportation and storage issues are factored into the equation.

Turning this around—that is, transforming agriculture into a process that has a positive, rather than negative, impact on global climate change—forms the basis for a truly sustainable practice of land and crop management that benefits all of us. This goal of an agriculture which is responsive to the amelioration of global climate change recognizes the various points at which agricultural practices intersect with the global carbon cycle, and employs them in such a way that inputs of carbon are increased (soil sequestration) while outputs (emissions) are reduced. Organic agriculture already has many elements in place that make it suitable for achieving these ends. Because pesticide and chemical fertilizers are not utilized, for instance, fossil fuel use is reduced both in the means necessary to produce such products in the first place and in the elimination of emissions produced when applying them. If we restrict our practices to only organic methods we lose many, if not most, of the opportunities for enhanced sequestration and further reductions in CO₂ emissions that can also be realized through incorporating reduced tillage practices. Key elements of a new sustainable agriculture must accentuate positive methods of intervention that strengthen processes that already exist in nature. If tilling our gardens and farms is a net producer of CO₂, we must create viable no-till options for maintaining and increasing organic matter in these spaces. By doing so, not only do we decrease emissions, but we also increase the capacity of the soil to store increasing amounts of carbon. Taking advantage of the propensity for plant roots to sequester carbon at higher rates, emphasis should be given to crops or intercrops with deep root structures (planting strips and beds of perennial prairie grasses or clover between permanent areas of no-till annual crop production). Green manuring, or cover cropping between cycles of crop production, especially with plants capable of fixing nitrogen, also creates a beneficial ratio of carbon input compared to output.

Carbon, carbon dioxide, and agriculture: these three elements form a nexus of opportunity for addressing global climate change. Growing organically, making the shift to no-till practices, using intercrops of deep-rooted perennials, and incorporating green manures into one’s planting schedule are among the tools available to us as

we move forward to a new alignment between food production and the environment. Can we “grow” enough carbon on our farms and in our gardens to make a difference? Although “the use of carbon sequestration options should not distract us from the goal of reducing dependence on fossil fuels, the cause of the problem in the first place (FAO 2004),” they have the potential to extract enough carbon dioxide from the atmosphere to forestall many of the worst aspects of future warming scenarios. By transforming our agricultural practices to prioritize the accumulation of carbon in our soils, we can all play a role in this effort, bringing us a future where we all might be able to breath a little easier.

Wade Collins

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GROWER INTERVIEW WITH DON TIPPING

(fourth in a series)

by Scott Vlaun

http://www.seedsofchange.com/enewsletter/issue_64/farmer_interview_four.asp

Don Tipping and his wife Kimberly have been growing seeds for Seeds of Change for ten years. Their southern Oregon biodynamic farm is known as a model of sustainable agriculture and reflects Don’s longstanding involvement with permaculture. In addition to producing high-quality seed, the Tippings grow and care for over 100 species of plants and animals in a deeply integrated and ever evolving system. I spoke with Don about his farming strategy on October 15th, 2006.

Scott Vlaun: In walking around your fields, I’m struck by the lushness and diversity of the plants. It’s clear that you’ve got very fertile ground. Can you talk about your strategy to maintain soil fertility from both a permaculture and biodynamic standpoint, and how that affects the overall nutrition of the food you grow here?

Don Tipping: Those two go hand in hand really. Biodynamics is an older whole-systems viewpoint. We eat food to stay alive. In conventional agriculture you fertilize plants for yield to get the maximum size and growth rate. There’s no attention paid to flavor, nutrition, storage quality, the spiritual life force, and those kinds of things. Biodynamics looks at all that.

Permaculture looks at it all as well because you want to look at it from all angles. We focus more on mineral fertilization and setting up systems that create opportunities for mineral foraging by different plants, be it buck-

wheat or alfalfa. The more diversity of soil/root interactions, the more opportunities you have for mineral foraging. You're basically mining up minerals. In biodynamics you don't want to do one-sided fertilization, such as using heavy nitrogen to produce dark leafy greens. You also want to have your minerals, your phosphorus, your silica, all of that, in balance so that the plant that you're getting is a representation of more of its totality.

In the permaculture vein, we're shifting gears this year, our sixth year of farming here. In that quarter acre down there we just planted alfalfa and red clover. Instead of our normal cover crop of rye, peas and vetch, planted in the fall and tilled in in the late spring, we're planting it into this perennial cover and it will remain in that for three or four years. We'll cut hay off it or cut it as mulch and let our animals graze it. But those are all secondary to keeping the soil intact and creating a whole soil ecosystem, which the annual cover crops can only take so far since they only have so long. But alfalfa, or something that's in the ground for years, creates a whole new relationship with all the microbes and bacteria and soil fauna that moves in. The system isn't getting disturbed as much as agriculture where you are tilling. Then if we go into that three years from now and till it in, that soil is going to be incredible. And then we'll take another block on the farm and put it into that rotation. This way we'll have this rotational rest period. It's kind of like in music when you have a barrage of notes, if there's no space it's hard to hear pattern or melody or even rhythm. I think this (kind of rotation) could help with the symphylans problem that is plaguing a lot of the big West Coast growers.

Symphylans are an arachnid, technically. They look like a little white centipede kind of guy, but they don't have that many legs. They only have eight legs and they forage on decomposing organic matter. They are native in our old growth soils, so they're supposed to be here. If we plant a cover crop and let it get big and till all this organic matter into the soil, the symphylans move in and perform their role as decomposers. Then when it's decomposed you till again, prepare your beds, or your seeds and put in your transplants and the symphylans go nuts on it. I think ten or twelve symphylans per cubic foot of soil can mean major crop losses.

I think that the problem, and a lot of other permaculture-oriented people think this, is force feeding, cramming compost, cramming fertilizers, cramming cover crops, green matter into the soil is disrupting the soil. This is more like layer caking. We'll put a little compost on in spring as more of a biological inoculant, but the fertility is coming from the cover crops. The ultimate system in this vein is "no-till."

SV: How do you rotate animals through your system?

DT: That's a whole other part of it. We use portable electric netting. Like this field right here for instance, it was a cover crop, four feet high or so, and we used the netting to bring in the sheep and they grazed the cover crop down. So instead of mowing, which is killing frogs, killing snakes, killing salamanders and other creatures that are in this incredible...you know it's like a tropical forest on a micro-scale. The sheep, they don't hurt anybody. They're just walking through eating. And they take it down to nothing and they're in heaven. They're converting it into manure right on site and then we'll make beds after that.

The way most farms would do it is to mow it, which is an aggressive action, then till it in which is unnatural, it only happens when you have a landslide. Instead we are converting it to manure and to sheep energy. We're getting wool and meat and manure from them, and the service of grazing. We didn't have to use fossil fuels to mow it down. Then we till that in and the manure breaks down much more rapidly than the cover crop would and we don't have all that green material and that kind of anaerobic ferment. Also, we get that energy that Steiner talks about—the astrality of animals. (Rudolf Steiner is the founder of biodynamic agriculture.) We're animals so we need that type of fertility. Plant fertility alone cannot nurture us. We need that kind of fertility that's the result of this dynamic interaction between plants and animals in order to create food that has the life force that humans need. We're looking for more ways to incorporate our animals. Our ducks and chickens have access to our perennial areas. This used to be a flock of sheep in here. As an ecosystem, it's going through more evolutionary loops than a more streamlined system. And this, because it's a seed crop, is going through an even further evolu-

tion because it's going to sit all winter like this.

SV: I'd really like to hear about how you integrate seed production into your systems here, but first could you give an idea of the scale of your operation. How many acres are you farming?

DT: We have two and a half acres in annual row crops, and about two acres in perennial berries and fruit trees, and about three acres in permanent pasture that may have trees inter-planted in it. These are hazelnuts in a pasture basically with some nitrogen fixers.

The seed crops are really beneficial in that we create ecosystems instead of just a crop. We created a system where it's in the ground longer. There's more opportunity for native birds to interact with it. There are more opportunities for us to learn from the plant, in terms of how it expresses its life cycle.

SV: It's always so interesting to see mature plants that you usually never see when you grow just for the vegetable crop.

DT: Like leek flowers, that kind of thing. And because we have markets that we go to, we can go into a lettuce seed crop and do genetic selection work. We can rogue out plants that are off types, but those are perfect for our CSA or farmers' market, especially the CSA because we can talk about what we are doing in the newsletter. For instance, we put winter squash in the boxes for the last two weeks, but they were cut open with the seeds scooped out and we explain that we are saving them time by cutting it open, and we are getting a seed crop. Otherwise this would be a waste product on our farm or we would feed it to animals. So we're bringing the consumer into understanding the role of seed production. You're not going to get that squash unless there is seed. We happen to be growing the seed for more than just our farm. With the CSA I think there is a little more openness and tolerance, whereas at the farmers' market some people might not be so sure about that, although sometimes elderly people have trouble cutting those hard shell squash, so we see it almost as a service that we are providing.

SV: One of the things I'm noticing just walking around is the scale that you are working at. I've been on some much larger farms lately and I'm noticing that here there is a human scale to everything. You've got ten acres here and you could choose to develop a larger-scale cropping system. How have you laid out the ground and how do you think about scale?

DT: That's part of permaculture. There's that principle that says "use thoughtful protracted observation to avoid thoughtless protracted labor." So we've looked at this land and said OK, North slope, forested, trees all around us. So we should be growing tree crops, but we can't plant the whole thing to an orchard or back to native trees because we need to earn a living. So we have a mosaic of trees that are starting to generate income six years after planting. But in between we have our row crops, which is a proven mechanism that we have for earning a living. But over time I see us phasing out of row crops. We used to do more truck farming, selling or wholesaling produce because we didn't have any perennial fruits. So we had even more land just in annuals that way. But as we move through time and the perennials are able to carry more of their own weight, so to speak, and they are earning us some money, we can take more land out of annual production. So the land that we do have in annual production is increasing in value because we are able to do crops that we know we can do really well on. We've figured out that on the Alliums, Brassicas, and lettuces we can do a really good job growing seeds. And also if we're doing breeding work we're not just producing a bulk commodity, we're producing information, knowledge, and progress in one form of the genetic material. So I see that in twenty years or so, that we might have only a local community scale of the annual agriculture that we do, and then that our tree crops are our export agriculture, whether it's chestnuts, or these Turkish tree hazels that are going to be 75 feet tall and make a lot of nuts. Maybe we don't even sell the nuts. Maybe we sell pork or beef or lamb or turkey meat that is fed on nuts. We're looking at how we can set up a dynamic enough system—with lots of different things. We

don't have a whole bunch of hazelnuts, we just have a little bit so we can see how they do here.

What other opportunities are there? Just this year we grazed the sheep up here, so we are getting multiple yields. How to increase those over time is the question. It's harder to do that if all you have is a truck farm. You know, you only have so many opportunities for diversity.

SV: How many different species of plants do you think you are cultivating here, not counting the wild species?

DT: I've never counted, but it's probably close to a hundred. Because we have a forest garden that's a quarter acre down there, where we cataloged everything. We made a conscious decision to try and get as many edible and medicinal plants as possible in there. It's basically our nursery where we can go back for scion wood, cuttings, tubers, nuts, or whatever for propagating this stuff out. We've definitely learned a lot. I planted some hardy kiwis down there that I'm going to pull out. They're doing okay, but I have the irrigation set up to do orchard and row crop stuff, and the kiwis would work great on an arbor around our home. They're not a good crop for us here commercially so why have them set up in a commercial fashion? So that's part of learning from your mistakes. I like the idea of starting small and learning from your mistakes. And then you can take that a step further and learn from the mistakes of others.

SV: You mentioned something earlier about education. It seems like, beyond what you're learning here and your production, you also are quite involved in education. Do you teach classes here?

DT: Through Organic Seed Alliance we have two field days here every year. That's reaching out on the seed level. We've also taught a number of permaculture classes. I've taught simple day classes through the OSU Extension and I've sat in as a guest instructor on other permaculture classes. People initially thought, "Oh yeah, I'm going to make a living becoming a permaculture designer or a permaculture teacher," but the market has become saturated here. People don't know where to go. So I think the trick of permaculture evolving in this country is to ask "How do we take those principles and concepts which are super-important and universal and infiltrate them into everything?" All of a sudden an Organic Seed Alliance workshop here that's focused on fundamentals of plant improvement is also a workshop in permaculture. You can't be growing seed crops unless you have an interface with them being vegetables. You need a CSA or a farmers' market to understand, "Oh, these are things people eat." We're not just selling seeds, we want to know if people like them. Likewise, having all of these different things working together, like the animals, and understanding their interaction with the seed crops is important. So we need to see how we can take permaculture into each of the genres of agriculture, or architecture, or whatever it is, and form a much more principle-based approach to education. So that's been my challenge—how to do that rather than try to sell a certain technique or method, because that's so specific to your region.

SV: If there's one thing I've learned studying permaculture is that every situation has a different set of solutions. I like what you're saying about your process of evolving this place and learning and changing and growing and adapting your systems as you observe.

DT: When we moved here we were all fired up on becoming a demonstration site, so to speak, and doing workshops. Our first year on the land we did a permaculture course, which was super helpful to lay things out. But we saw certain other things. It's easiest to do courses in the summer, but when we're doing markets and have employees, it's a little tricky to say that for the next two weeks we're going to do this different thing. So now we're following another principle that I like: Work where wanted. Don't try and say, "Hey, you need me," or "Hey, you want to do this." People come to us now. I think there's something about working where wanted that helps all your interactions.

SV: Can you talk a little bit about your food forest nursery? How big is this plot and how many species do you

have here?

DT: This is about a fifth of an acre and we've got about 75 species here. This was really rocky, poor soil when we got here and I had all these trees in nursery beds as I was learning my propagation skills over time. So I had all these trees and not any real place to put them until we got this place. So we planted them out on contour, actually a little bit off contour. The beds actually drop toward the creek about one foot per hundred feet of run. As we sheet mulch and build up these little micro-terraces, when water flows and hits these, its going to drift up the ridge. You always want your contours, if they are going to have a drop, to drop away from the valleys. In a way, we're doing Aikido with the way water works in the landscape. We're constantly trying to divert it up hill. It's not technically moving up hill, but we're keeping it as high on the ridge as possible.

Over the last two years I haven't done any weeding, mulching or pruning in there and I only water once a month, and that's pretty extreme for here. Normally I'd water this once a week.

SV: Is that because of the mulching?

DT: The mulching, and also to test out how far you can push a system like this and learn what plants can perform in a low-input system. To me, that's where the permaculture is going.

So this is basically our food forest with multiple canopy layers. We've got Sea Buckthorn, a nitrogen fixing shrub that makes tons of berries; Rugosa Rose which doesn't really perform too well in drought conditions; and Elderberries which haven't done so well although there's one down there that's done outrageously well. Catnip has just come in from birds. There is a Gooseberry. We had geese in there until last week and they ate all the leaves off it. There's a Cardoon coming back. There is a Red Bartlett pear and Blue Vervain. We have lots of medicinals. There is an apricot from seed that's died back to the roots a couple of times. Those tall ones are six years old and we've actually gotten food from them. Normally you'd never plant apricots there because it's too cold.

SV: Why do you think you've got them to produce?

DT: I think it's because I don't prune them. All my fruits are way high up and they escape frost and use all that space up there. And that's part of the whole multiple canopy thing that we're trying to go towards. We have lots of space for all these currants and herbs down underneath here, and let the trees occupy the higher space.

Yarrow is just one plant that I've let go wild in there—and comfrey too. You can see what the geese do to the comfrey. That was a total comfrey patch and they've eaten it all down. I'll bring the chickens in there soon and they'll bring it down to bare dirt by March. Then I take them off and it becomes a jungle with comfrey this high (gestures toward his chest).

We're really getting some climate modification effects with this whole other under-canopy for livestock. Chickens really don't want a field environment. They like scratching through duff (decomposing organic materials that resides between the mineral soil and the litter layer of freshly fallen twigs, needles, and leaves). Maybe an edge.

A lot of these plants I've only got one representative of. Siberian Pea Shrub is another nitrogen fixing leguminous tree that gets twenty feet tall and the seeds are thirty percent protein. It just drops the seeds so the chickens get that.

For me this is really an opportunity to learn about these plants before putting them out in our fields. As much as this is a food forest, it's a learning lab. It's interesting so see what happens when you start these chain reactions,

and you're not mowing, so there are constantly saplings coming up down there. There are some weird things happening like this apple (tree) that's got some disease. It's dropping branches, but maybe that's just its way of pruning itself.

Sometimes I wonder "if I broke my leg, how permanent would this agriculture be?" In time my son and our next child will be able to help, but I'd rather have it where you just need to remember to harvest, rather than having to say "you're going to need to weed it, you're going to need to mulch it, you're going to need to prune it, you're going to need to water it every five days."

SV: How many of these species are native to this area?

DT: We're probably only about 10% native. We used to have more things like perennial broccoli and perennial collards and Good King Henry and all those perennial greens in here, but the poultry just annihilate that kind of stuff.

SV: So if you weren't running the poultry in here you could have another whole set of species on the ground.

DT: There's an appropriate animal mixture. One thing that we do in the winter is roll out this fencing and take in the raspberries. The chickens pretty much weed them completely and eat all the fallen dried berries in there. When I had more time, before Wally was born, we'd do all the grapes and other areas. A lot of the permaculture is about fencing and labor intensity. Kimberly and I joke that we want to write a book someday about what they didn't tell you in the Designer's Manual (The Permaculture Designers Manual by Bill Mollison.) Like, you'll spend way more time chasing animals, or being frustrated about things that don't work out, or that it requires lots of fencing. The Permaculture Designers Manual is just a systems overview, but paints a pretty rosy scenario of very complex systems that really depend on the situation.

We're beginning to see what works here, six years into working pretty full time on this, and what doesn't.

SV: Well, it certainly is beautiful here. If there was no other benefit behind all the diversity, I think it's worth it just for the beauty. Thanks for sharing it with us.

Scott Vlaun
Editor

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**URBAN AG: A GLIMPSE INTO NEW YORK CITY'S
ORGANIC FARMING MOVEMENT**

by Kelle Carter

http://www.seedsofchange.com/enewsletter/issue_64/urbanag.asp

My recent trip to New York City with Seeds of Change photographer Scott Vlaun evolved through a class on Agroecology that I attended at UC Santa Cruz this past July. I met many wonderful and knowledgeable people at this class. Owen Taylor, the Training and Livestock Coordinator for Just Food, a non-profit with a focus on food sovereignty in New York City, was one of them. It struck me as strange that someone who lived within the city limits of Brooklyn could have a job that included "livestock" in the title. I came to learn from Owen all of the amazing work going on in the city to provide people with good food and the knowledge of how to grow it. From our discussions of urban gardening in the city, I began to think about the need for seeds in these gardens, as well as education for the communities involved, and the call for a public showcase of the incredible work going on within city limits.

Our adventure began in the evening, about one hour before sundown. Scott and I rolled into the big city from the rural wooded landscape of Maine—quite a shock to the system. As we made our way through rush hour, I called Owen to see if we could make it to a farm or two before dark. He directed us to the heart of Brooklyn to meet a rooftop gardener named Jeff Heehs, Compost Coordinator for Red Hook Community Gardens. We arrived at his apartment and were instructed to “come on up to the roof.” Scott and I climbed the narrow staircase to the sixth floor and then made our way up to the roof via a ladder leading to a very small porthole. The view from the roof was amazing! The Statue of Liberty was off to the left, the Empire State Building hidden by some tree branches on the right, and in the middle was a fantastic view of Manhattan—quite a feat of human engineering! After I took in the view, I was again in awe at what was at my feet: beans, tomatoes, huge kale plants, marigolds, and butternut squash, all growing happily in their raised beds, 100 feet above the ground.

After we enjoyed the view, Jeff took us to the Red Hook Community Farm, a two acre garden with a mighty mission: youth empowerment and urban agriculture for a sustainable future in Brooklyn. This garden was located near one of the oldest ports in the city, so rather than dealing with the possible toxicity of the soil, the community decided to bring in soil. The plants on this farm were growing in two feet of rich composted soil (derived from city zoo waste and leaf litter) right on top of asphalt. This farm was really a true test of what a community can achieve when everyone is working together for a shared goal, in this case fresh food within the city limits. In addition to adding beauty to the city streets, the Red Hook Community Farm was taking waste from local restaurants and creating rich compost to enrich their growing environment. This place is a site of amazing food production, as well as a learning facility for the youth of Brooklyn to engage with their community through weekly markets, and it is a space for empowerment, skill development and knowledge sharing.

The next day was a full one. Owen and his colleague Jane Hodge, the City Farms Program Manager of Just Food, had graciously arranged for Scott and me to tour a number of city farms from Brooklyn to the Bronx. Our first stop was the La Familia Verde Farmers’ Market located at the intersection of East Tremont and La Fontaine Avenue in the Bronx. This market attracts farmers from upstate New York who have farms 1–2 hours away, as well as city farmers who bring their wares from local urban plots. Along with the farmers, other vendors include community members who are volunteering their time, school kids earning a stipend, and people offering cooking demonstrations. The produce on the tables added a splash of color to the city streets with purple eggplants, red and green habanero peppers, multi-color flour corn, and swollen green watermelons. There was all sorts of produce available to meet the culinary needs of the locals who cooked within the Mexican, Puerto Rican and Jamaican tradition—a feast for the senses.

As Scott and I were talking with the market growers and generally taking in the scene, a gentleman walked by looking perplexed. He looked at me and asked what was going on. “This would have been a violation... I’ve never seen this in my day,” he remarked of the produce strewn about on tables under the tents. It was indeed quite a sight: fresh produce available to the masses in a sea of convenience stores that seem to specialize in liquor and potato chips. One of the volunteers, Laura Washington, pointed out a sign along the street, “No Standing Except Farmers’ Market Vehicles 8AM–3PM Tuesday July–November.” This simple sign was a symbol to me of how this movement is being taken seriously by the city and the community.

In addition to running this farmers’ market, La Familia Verde also takes care of an urban garden plot, the Tremont Community Garden. Mrs. Washington was the gracious hostess for our garden tour. She explained how this abandoned plot, that has been a garden since 1973, became a community gem. “This place was a real eyesore. The females got together to clean up the area and then our husbands, brothers, and others around came and helped us clear out two abandoned buildings on the site.” In 1999 the mayor wanted the property for “affordable housing,” but thankfully the Trust for Public Land came in and purchased the land and gave it to the community. There are currently about 30 members of the Tremont Community Garden who work hard to produce food and a space for all to enjoy. A huge barbecue grill and covered sitting area are testament to the delight that this space brings to the neighborhood. Mrs. Washington made it clear in her sentiment: “This place is therapy for all of us,

especially the aged.”

A Spanish song was blasting from a nearby apartment, giving a festive feel to our tour. Mrs. Washington pointed to large willow trees given to the garden in remembrance of 9/11. She showed us the raised garden plots benevolently tended to by families, a children’s garden, and a space cared for by a senior citizens group. The gardens boasted all sorts of colors and aromas and I was shocked to see a marigold plant being visited by bees! As we walked around the garden, a man came walking in, seemingly amazed at what was there. Mrs. Washington confronted him and he said he was just checking it out. She turned to us and exclaimed, “Got to be careful who you let in. I’m sorry, but this is the Bronx, baby.” Even so, this inclusive garden has fed and taught many people within this community. I would not be surprised if that visiting gentleman comes back next season to work his own plot of land.

The next garden we went to was the Taqua Community Garden, located on 164th Street in the Bronx. This garden was started by the father and son team of Abu Talib and Bobby Watson. Bobby described the site before the garden as a “dumping spot for garbage, a drug hole, and a general eyesore of the neighborhood.” That all changed when GreenThumb (a program of the New York City Parks Department) came in fourteen years ago and purchased the land for the community. The landscape has been completely revived from its original use as a dumping ground and it now features over 15 different kinds of fruit trees, a medicinal herb garden, multiple vegetable plots tended to by various families, and even a bee hive. There is a farmers’ market on site every Saturday that acts as an educational tool to those who happen to stop by. Bobby remarked, “Do you know where your food comes from? It makes you think...” Having the market on the other side of the garden fence teaches that point very visibly.

In addition to growing food to nourish the neighborhood, Talib also acts as a sort of medicine man for the community. His vast knowledge of medicinal herbs is shared with those willing to listen. Talib’s son Bobby explained, “He doesn’t prescribe, but he tells them what it (herbs) does for him.” As we were walking about the property, Talib pointed to a stand of Motherwort, explaining its use for easing the pain of gout. He remarked, “Everything you need to be healthy is in the garden...you get sick, where do you run? You run to the garden.”

The Taqua Community Garden has over 65 volunteers in addition to Bobby and Talib. People come to the garden because they are interested in what goes on there. Some people come and work and maintain their plots, but Bobby was quick to point out that there are those who come and plant things and expect them to take care of themselves, hoping to return to a garden full of vegetables. “People come back to the garden after no work for a few weeks and ask, ‘What happened to my garden?’ Good question! Plants are like kids, if you don’t take care of them, you have nothing.”

Bobby and Talib are originally from the Carolinas. Bobby told us about having to work hard in his father’s garden as a child. He swore that when he grew up he would never work in a garden. He eventually changed his perspective while working in a grocery store and seeing how much people had to pay for produce that was not all that good. One day his father asked him to help him dig a garden bed and, as he says, “I still have not put down that shovel.” Talib put it right when he said, “You gotta want to do this kind of work. If someone told me to do this, I’d say ‘Hell no!’” I think this is a perception shared by all of those who tend the soil, be it a small-scale gardener or market grower. It is hard work, but the rewards often outweigh the inputs. Before we left Taqua, Talib presented Jane with a large “bouquet” of Comfrey, also known as boneset, to speed the healing of her recently broken ankle.

One of the very unique qualities of this garden is that it is located a few blocks from Yankee stadium. Bobby told us about watching the games on his television, and then hearing the crowds cheering from across the way. He also said, “It is a nice place in the city to watch the full moon.” This garden acts as a teaching tool, but it seemed to me that the main mission of the plot is to feed people, be it kids climbing trees for cherries or collard

greens that will be frozen to feed a family at Thanksgiving. As Bobby puts it, “This is a real healthy place to hang out—I couldn’t imagine standing on a concrete stoop in the morning... This is a much better place to hang out.”

El Girasol Community Garden was next on our whirlwind tour. This garden is located on 138th Street between St. Anns and Cypress Avenue, and it hosts youth programming by For a Better Bronx. This garden also has a market, worked by the students who help to grow the food—creating a much-needed link from seed to plate. Molly Culver, a garden organizer, explained how this plot of land is creating food sovereignty in the city. She told us that last year, this 18 by 25 foot plot produced \$1,000.00 worth of food. They used the money to buy seeds, garden tools, and tables and tents for the market.

In addition to the students’ garden, other community members have their own garden plots. Shelia Rosario, a native of the Virgin Islands, gave us a tour of her personal garden. She pointed to her eggplant and pepper “trees” and her white raspberries and grapes, which she described in her jovial island accent as “Out-a-sight... I am so proud of them!” Her garden was a host to all sorts of biodiversity, including a Redwood tree and hibiscus in full bloom, gifts from the Brooklyn Botanical Garden. The flowers remind her of her St. Croix home and the garden brings her joy. “This is my getaway, my exercise thing—you know what I mean?”

I observed over 100 different species of vegetables, herbs, and flowers in this small space. Scott and I were even shocked to see yacon growing.

Our last stop on the urban farm tour was to the United Community Center Garden in Brooklyn. After battling rush hour traffic, we finally made it to this oasis just before dusk. This garden had a pond with koi (brocaded carp) shaded by a huge willow tree, a water catchment system that harvests rain from nearby apartment rooftops, productive bee hives, and above it all was an elevated train. Quite a sight to behold!

Scott and I were given a very informative tour by Jonathon Scott, a high school student who has worked in the garden for two seasons. Jonathon’s enthusiasm and knowledge said a lot for what this community garden is producing; aside from lots of produce, it is empowering the youth and creating a knowledge base that might otherwise begin to fade as our food is increasingly grown by mega-monoculture farms. The farm also specializes in cultural food crops, such as bittermelon and papalo, creating a market for people who would otherwise have a hard time finding these flavors, keeping culinary traditions alive and giving an essence of culture to the garden.

Being a dweller of rural spaces, I must admit that I had some trepidation about journeying into New York. I had the standard big city stereotypes of rude people, too much traffic, dirty streets, etc... I was pleasantly surprised that over the course of our trip, all of my stereotypes were dissolved. Scott and I were greeted by incredibly kind and generous garden hosts. We were delighted by glorious colors and scents permeating the community gardens that seemed to be located on every other street corner. New York City has certainly got something amazing going on. To me the gardens in the city are a symbol of hope and inspiration in uncertain times. The people have proven that they have the power to create amazing things and they are doing it together by creating community spaces that feed and empower all that happen by.

Kelle Carter
Farm Field Coordinator

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FARM REPORT: NOVEMBER 2007

by Kelle Carter

http://www.seedsofchange.com/enewsletter/issue_64/farmreport.asp

Now is my personal favorite time on the farm—the autumn harvest season. The cottonwood leaves are yellowing and slowly falling to the ground, the fields are bright green with cover crops, and the air is crisp and cool. It is a somewhat quiet time here; the interns have left for the season to pursue other interests and seed is slowly arriving from our seed farmers for cleaning. We are lucky to have one intern stick around for the winter seed cleaning season. Evan Snow will be helping Emily Skelton in the seed warehouse this coming winter. This is also the time of year that we work on creating our upcoming catalog. We are currently in the final editing stage of this process—look for our 2008 catalog in your mailbox sometime after Christmas.

We were extremely lucky to have Scott and Arina Pittman of the Permaculture Institute teach a course on our farm during the first week of October. The course, “Permaculture for Sustainable Farming and Gardening,” lasted five days and was attended by 20 people from all parts of the US. The course focused on permaculture ethics and the principles of natural systems in relation to design, and relied upon our Research Farm as a hands-on model. Activities included plant division in the perennial garden, an introduction to topbar beekeeping with guest lecturer Les Crowder, planting and sheet mulching of the pollination hedge, and planting over 40 trees and shrubs to create a new windbreak on the farm.

Due to the enormous success of the course, we plan on offering three similar classes next year. The classes are currently planned for May, July and September, and add up to thirteen full days of class that will reward the attendee of all sessions a certification in Permaculture Design. Be sure to look on our website for dates and more information.

Other news on the farm includes the building of a permanent straw bale chicken shed. Evan has designed a wonderful building that is composed of six beams and a roof. The walls will be built using straw bales that can be removed at the end of the winter season, making the building a perfect shade house. There will be two rooms separated by a wall of bales: a brooding room and a nesting room. Other benefits of this clever design include two separate fenced-in fields to create a rotational grazing area for the birds. We hope to increase our current flock of twenty-two this spring and possibly get some turkeys as well.

Poultry is a must for any farming or gardening operation, large or small. We recently moved our portable chicken tractor and fence to encompass a worn-out patch of lettuce. The chickens have cleared a 100 foot by 40 foot field in less than four days, reducing our work, and eliminating the compaction usually induced by the tractor during tilling. The chickens have turned the bolted lettuce into healthy eggs with deep orange yolks. After we move the chickens into their newly finished house, we can then plant cover crops on the cleared soil.

I hope the harvest season is filling you and your loved ones with the bounty of the season. Enjoy this beautiful time of year.

**Be Well,
Kelle Carter
Field Manager**

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NEWS & VIEWS

http://www.seedsofchange.com/enewsletter/issue_64/news.asp

France Outlaws Planting of GM Crops

France is the latest European country to place a ban on planting genetically modified (GM) crops. An article from Reuters news agency describes a decision made by French President Nicolas Sarkozy to suspend the planting of GM crops until more is understood about their potential harmful effects. France, the largest agricultural

producer in the European Union, is set to initiate a study later this year by a newly-created authority to address the issues that cultivating GM crops may raise.

Sarkozy emphasized that the ban did not require research on GM foods to be stopped. “This suspension of commercial cultivation of pesticide GMOs does not mean—I want to be clear on this—that we must condemn all GMOs, notably future GMOs,” the French president said.

The ban does not affect the farming of MON 810, a variety of genetically modified maize that represents 1.5% of France’s maize crop and that was produced by Monsanto to combat the European corn borer. Monsanto’s contract to sell this variety must be renegotiated with France in early 2008, by which time the new study should have results to report.

Austria and Hungary have already outlawed MON 810, and Germany required the institution of a monitoring plan that charts the crop’s effect on the environment in order for it to be sold in that country. The role of GM crops in the marketplace has been a hotly contested issue for European countries, while the United States, in sharp contrast, has more readily accepted the crops. Those who follow the topic are quick to point out that awareness of the issue is much greater in Europe, where EU countries are required to label foods bearing GM ingredients; the U.S. enjoys no such law.

Read the complete Reuters article here in.reuters.com/article/worldNews/idINIndia-30164820071025?pageNumber=1

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2007 Farm Bill Holds Promise and Threat

As of this writing, the Senate is still debating the 2007 Farm Bill, with progress stalled as politicians argue over how the amendment process will work in debating the bill. Within the Senate there is a wide degree of flexibility regarding the rules governing floor debate of legislation and an agreement has not yet been reached on the nature of amendments that will be allowed to come up for debate.

In its current form, the Farm Bill will authorize new funding for farmers transitioning to organic agriculture, support for organic agriculture research, funding for improved data collection (to result in better crop and yield information for organic producers), and removes the 5% premium that organic producers have been charged by the USDA for crop insurance (despite the fact that lost crops have been compensated at rates for conventional crops, not their higher market value).

While much of the bill contains many provisions beneficial to organic farmers, it is far from perfect in the eyes of many critics. Organizations working towards equity for small farmers point to the need for a cap on the amount that individual farms can receive as subsidies. The overwhelming majority of subsidy funding is currently awarded to large farms, who many accuse of not needing the subsidies that critics say could be put to better use in funding small and medium sized farms. In a recent article Farm Aid President Willie Nelson urges concerned citizens to ask for “a farm bill that assists young people who want to start farming; one that restores fairness in the marketplace so family farmers can compete with giant food companies and factory farms; one that puts better food in our schools and rewards farmers who transition to sustainable methods.”

The current version of the farm bill would also mandate the implementation of the highly-contentious National Animal Identification System (NAIS). This system is aimed at identifying and tracking the movements of all food animals and livestock within the United States. The benefit of the program, according to the USDA’s NAIS website, is that it will “protect the health of U.S. livestock and poultry and the economic well-being of those industries” by allowing disease outbreaks to be quickly traced to their source. The law will require that all livestock animals, even a single horse or backyard flock of laying hens, be identified, typically with a visual tag

with radio frequency identification technology, and that all premises that the animals live on be entered into a national registry. Critics, such as Family Farm Defenders, accuse this system of placing an unnecessary financial strain on small farmers and of introducing an Orwellian level of government scrutiny.

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Early Findings of European Study Show Organic Food is Better For You

In Newcastle, England a 725 acre farm is host to a study being conducted to systematically document the difference in nutritional content between conventional and organic food. Preliminary findings have revealed that organically produced foods have substantially higher levels of “beneficial compounds.” The compounds represent minerals such as iron, copper, and zinc, and vitamins and secondary metabolites (believed to lower the risk of cancer and heart disease).

The farm, associated with Newcastle University, is joined by 32 other academic institutions across Europe that have been studying the benefits of organic food over the past four years as part of the EU funded, Quality Low Input Food (QLIF) project. Although large variations exist in the nutritional differences between different crops, thus far the study has indicated that organic produce and milk are more likely to contain beneficial compounds. Professor Carlo Leifert, the head of the QLIF project, reports: “We have a general trend in the data that says there are more good things in organic food. We are now trying to identify the agricultural practices that are responsible for this.”

This study was originally reported on by The Sunday Times. Click here for the complete article www.timesonline.co.uk/tol/news/uk/health/article2753546.ece

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Massive Plant Information Database Made Available Free to Public

For over thirty years the University of Minnesota has been compiling data on plants and this effort has resulted in one of the world’s largest collections of horticultural and botanical information. The Plant Information Online database amasses that information in an easy-to-use resource that is now available to the public, free of charge.

Users looking to acquire a specific plant can find contact information for over 900 plant retailers and over 2000 seed and nursery businesses in North America. These sources represent access to over 100,000 varieties of plants.

Another section of the database offers links to expert-selected websites with region-specific information on growing plants within the United States and Canada. Through these links, growing advice can be found on over 8,000 plants.

Scholars and botanical experts will take note of the “Book and Magazine Citations to Plant Info and Images” section, which includes almost 350,000 bibliographic citations to over 130,000 plants around the world. The listings describe which sources contain images of specific plants, as well as what parts of the plant are pictured. Information about the plants often accompanies the images. Three centuries of botanical illustrations have been culled to produce the extensive index.

While the large size of the database may seem daunting, helpful search tips are offered to assist users in finding the information that they’re looking for.

Updated daily, the Plant Information Online website is sure to be of use to hobby gardeners, botany students, owners of curious minds, and more. plantinfo.umn.edu/arboretum/default.asp

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