

TREE CITY USA BULLETIN

No. 59

Dr. James R. Fazio, Editor • \$3.00

Permaculture and the City

While most issues of Tree City USA Bulletin try to communicate and encourage best practices that are being used in urban and community forestry, this edition attempts to catch a wave of the future. It reflects a movement that some call the Urban Farm Movement, or an attempt to grow fruit and other food literally in one's backyard. A goal is not only to provide an affordable and available source of healthful food, but also to grow it in harmony with nature.



Photo courtesy of MidwestPermaculture.com

Beauty combined with utility have transformed this Illinois front yard into a model that inspired neighbors to follow suit. In 2006, its owners began with a water-retaining rain garden, flowers and five edible plants. Wanting to see how much food they could produce, these permaculture pioneers now have more than 40 edible plants growing in this space.

The term 'permaculture' is not one that is widely recognized. Although it has been around since the environmental movement of the 1970s, it has yet to become a household word. The principles and practices of this concept may be even less recognized, at least as applied in the broad context of urban forestry. But the time may be here for permaculture to be on the palette of tree boards and city foresters who increasingly take a holistic view of communities as urban ecosystems.

The name and ideas of permaculture originated in Australia with Bill Mollison and David Holmgren who are credited as the founders of this school of thought. The word is a contraction of 'permanent agriculture,' or cultivating crops sustainably. As outlined on page 2, key concepts are

production for human use and multiple purposes, but in harmony with nature by mimicking nature. And although it began as a means for household and community self-reliance, it soon took on a larger meaning – a design system for creating sustainable human environments.

In this issue, we present the basic philosophy and principles of permaculture, and showcase some ways it is being applied in American communities. However, a caveat is in order. The intention here is to plant seeds of thought. How any part of this may be useful in your community may take some thinking 'outside the box.' Then again, that is exactly what inspired permaculture in the first place.

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Some Principles of Permaculture

The fundamental philosophy of permaculture is to work with nature instead of against it, observe thoughtfully, and look at plants and animals in all their functions rather than treating any as a single product. It also has a standard of ethics. Specifically, care of the earth in its living and non-living forms; providing for our own basic needs; and contributing surplus time, money and energy to helping others. Initially, permaculture dealt mostly with elements of design. Now it encompasses much more.

Principles and Examples for Urban Forestry

Permaculture is complex and we provide links to much more information at the website noted on page 8. Above all, it is a way of thinking, or a way of approaching the stewardship of resources. Although not all-inclusive, here are some basic principles as modified from a list offered by Rosemary Morrow in *Earth User's Guide to Permaculture*. Examples have been added in an attempt to show how these might apply in urban forestry.

<i>1. Everything works at least two ways (multi-purpose)</i>	A living fence or windbreak can be placed to provide privacy and control snow or wind. But a mix of species can be selected to provide food for wildlife and humans.
<i>2. See solutions, not problems</i>	Some municipal managers view pocket parks or odd parcels of public property as nuisances. Instead, they can be 'forest gardens' (See page 6).
<i>3. Cooperate rather than compete</i>	Form partnerships with groups not usually associated with urban forestry, e.g. social welfare agencies or food banks.
<i>4. Make things pay</i>	Recycling through reuse, including tree stakes, irrigation from water treatment plants, cardboard for orchard mulch.
<i>5. Work where it counts</i>	Inventory-based management planning; prioritized pruning; use of Plant Health Care principles of least impact methods of pest control. (Bulletin 37)
<i>6. Use everything to its highest capacity</i>	Water retention techniques; green walls and roofs; Nature Explore Classrooms instead of asphalt playgrounds; trees instead of sod or rocks in spaces between street and sidewalks.
<i>7. Bring food production to cities</i>	Urban orchards and community gardens.
<i>8. Help make people self-reliant</i>	Workshops on the selection, layout, planting and care of food-bearing trees and shrubs around the home.
<i>9. Minimize maintenance and energy inputs to achieve maximum yields</i>	Mulching around trees.

Characteristics of Permaculture

Permaculture can be used on farms, around houses in the city or country, on small acreages, or at schools and on public land of any size. Regardless of where it is practiced, here are characteristics as identified by Rosemary Morrow.

- Small scale, intensive land use
- Diversity -- of species, niches, social roles, etc.
- Integration of many disciplines
- Long-term sustainability
- Use of wild and domestic species
- Use of naturally inherent traits of the land, plants and animals (Energy and biological resources, including soil and water, are conserved, re-used, self-regulating and self-repairing.)



Marlene Gneke

Above Left and Above Right: Orange and lemon trees in downtown Sorrento, Italy. They illustrate the permaculture principle of multi-purpose by providing shade, food and beauty when integrated with streets and residential parking spaces.

Left: Phil Forsyth, an innovative landscape designer, lays out an edible forest garden as part of a year-long display at the U.S. Botanic Garden in Washington, D.C. Careful design and plant selection are necessary to help residents become more self-sufficient.

Urban Orchards

As the concept of permaculture evolved, it grew from design strategies to all-encompassing lifestyle choices. For example, it has come to include promoting bicycling instead of driving, living close to one's source of employment, reducing excessive consumerism, eliminating wasteful use of resources, and other environmentally responsible behaviors. Another idea is better use of public spaces. By planting fruit and nut trees on vacant lots, little-used grass areas, and even along streets and avenues, it is possible to implement some of the principles of permaculture and increase infrastructure benefits to the community.

Why Grow Fruit Trees?

Many communities are plagued with vacant lots, poverty, nutritional challenges and inadequate budgets for park maintenance. Planting food-bearing trees can address all these issues. Cities that have already started urban orchards operate in various ways, and virtually always in cooperation with nonprofit partners. After the initial expense of establishment, maintenance of an orchard is minimal and usually conducted by volunteers. Distribution of the fruit is done in various ways ranging from open harvest for anyone to selling part of the produce to fund maintenance and additional planting.

The Philadelphia Experience

"The urban permaculture movement is sweeping the world, with the United States being one of the last big holdouts," according to an editorial in the weekly *Chestnut Hill Local*. But in cities from Boston to Los Angeles, the idea of urban orchards is growing in popularity. One of the most successful programs is the Philadelphia Orchard Project, or POP. With some 40,000 vacant lots and some 25 percent of the residents in Philadelphia living below the poverty level, grassroots community leaders have transformed weedy, crime-ridden plots of land into community gardens, berry patches and orchards. POP was founded in 2007 and within five years it had established 27 orchard sites with over 300 fruit trees planted and nearly 700 shrubs and vines.

As with all urban orchards, side benefits include the usual environmental contributions of trees as well as positive social interactions. The orchards also make neighborhoods cleaner and safer, expose residents to new, marketable skill sets, and serve as demonstration areas and teaching opportunities to encourage residents to plant their own fruit and nut trees.

POP is a nonprofit organization that works in collaboration with a wide variety of community partners including schools, churches, community garden groups, city officials and others. Throughout planning and implementation, POP provides the expertise for designing the orchard, selecting plant materials, organizing events, and training. POP staff has developed a structured application process to make certain priority is given to needy neighborhoods and capable community partners. In all cases, the partner is responsible for ongoing orchard care and the distribution of products. The partner is also required to raise at least \$100 for soil testing and the purchase of hoses and other maintenance supplies, and at least two individuals must attend a training session. Besides how to plant, training focuses on the details of

implementing and supervising annual needs as outlined on the basic orchard care calendar:

Spring:

Monitor, water as necessary (5-10 gal./tree in young orchards), weed, fertilize, re-mulch

Summer:

Monitor, water, weed, thin, harvest

Fall:

Monitor, water as necessary, weed, harvest

Winter: Prune



Neighborhood volunteers help create a new orchard under the sponsorship of the Philadelphia Orchard Project.

© Philadelphia Orchard Project - phillyorchards.org

Permaculture and Nature Explore

Nature Explore Classrooms and their nature-friendly backyard spaces called Nature Explore Playscapes provide excellent opportunities to incorporate permaculture principles as children are introduced to nature. In the permaculture feature within the book, *At Home With Nature: Creating Nature Playscapes for Families*, Fred Meyer offers these suggestions:

- In each Nature Explore area, try to mimic the patterns and processes found in healthy ecosystems. For example, create habitat that includes beautiful perennials that also attract insects and that will be self-regulating, recycling materials and nutrients. Children can learn how these plants provide biodiversity while cleaning the rainwater. In turn, this contributes to the environment and helps children develop skills in observation and reasoning.

- Integrate food plants. By including low-maintenance, edible plants you can teach about healthy foods and our dependence on healthy ecosystems.
- Include the children in planning. What types of wildlife should be attracted? Where should the plants be placed? What food might be grown?

Meyer emphasizes strategies to link elements into an integrated system. For example, a rain barrel under a downspout can capture water for nearby plants. The water can also be used in a winding trough that flows into a sandy place or 'Messy Materials Area.' A depressed rain garden can retain and cleanse excess runoff, watering hazelnut shrubs that provide food for wildlife and the children. Meyer writes, "When we link playspace elements and help each element perform multiple functions, we mimic relationship-building activities seen in healthy habitats."



Making Space for Permaculture

Lawns and turf grass certainly have their place in the community. However, when looking for space for fruit trees or forest gardens, consider these facts:

- The average suburban lawn receives 10 times as much chemical pesticides per acre as farm land.
- Homeowners are using 50 percent more herbicides than they did 20 years ago.
- A gas-powered push mower emits as much pollution in an hour as 11 cars.
- Lawns need 2 – 4 times more water than trees or shrubs require.
- The average homeowner spends about 40 hours simply mowing the lawn each year.

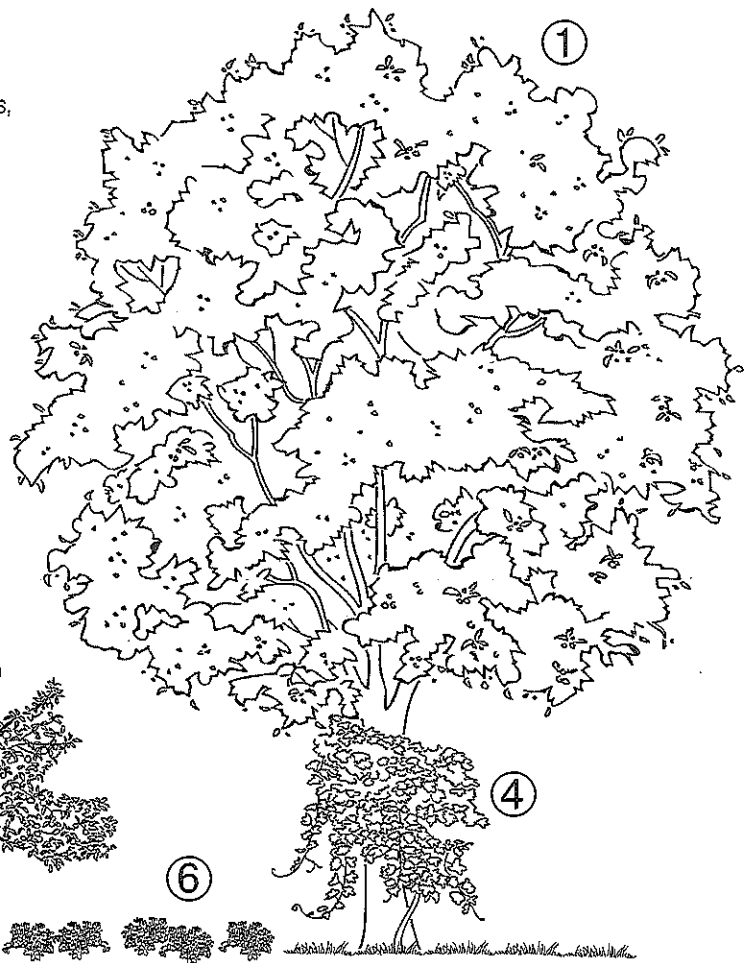
The Forest Garden

Natural forests are functioning systems with plants and animals each having a niche and playing a particular role in the system. One part of permaculture attempts to mimic that concept while at the same time sustainably providing for human needs. This is the 'forest garden,' or sometimes called the 'edible forest.' Size of the garden is not important. It is the design that matters and makes a difference.

A special feature of the Philadelphia Orchard Project is that it does not simply plant rows of fruit trees. Instead, the orchards are planned in permaculture fashion to minimize maintenance and maximize season-long productivity. And by planting in layers with a rich diversity of species, neighbors can begin harvesting (perhaps berries or vegetables) while waiting the several years needed for fruit and nut trees to begin their yields. The forest garden approach is illustrated below using POP's selection of plants as examples. The actual plants, of course, will vary depending on locale but the technique is suitable for any temperate or tropical climate.

Sheet mulch: Flattened cardboard and/or newspapers are spread to control weeds and covered with a layer of organic materials such as fallen leaves.

- ① **Canopy:** Large fruit and nut trees including walnuts, chestnuts, pecans, mulberries and American persimmons
- ② **Low-tree Layer:** Dwarf and semi-dwarf fruit trees – apples, cherries, figs, peaches, pears, plums, service berries, pawpaws
- ③ **Shrub Layer:** Blueberries, bush cherries, currants, elderberries, gooseberries, goumis, hazelnuts
- ④ **Vertical Layer:** Vines such as grapes or hardy kiwi
- ⑤ **Herbaceous Layer:** Chives, comfrey, lemon balm, lovage, rhubarb, yarrow (Useful plants that attract pollinators and other beneficial insects, build soil quality, and provide food, medicine or other products.)
- ⑥ **Surface Layer:** Low-growing plants such as strawberries
- ⑦ **Rhizosphere:** Perennial root crops such as sunchokes or walking onions



Transitioning to a More Sustainable Future

Within society as a whole, the individuals who currently embrace permaculture are relatively few. Good ideas often are not accepted quickly by the greater population or by governments. However, the few voices in the wilderness are now coalescing into various organizations. Their message “to transform a wasteful society to an ecologically healthy one” is being taken to communities throughout America.

Transition US

“Our vision is that every community in the United States has engaged its collective creativity to unleash an extraordinary and historic transition to a future beyond fossil fuels; a future that is more vibrant, abundant and resilient.” This vision drives the nonprofit organization, Transition US, a branch of Transition Network, an international organization founded in 2006 by two Irish businessmen. The movement grew out of work by permaculture educator Rob Hopkins and has resulted in numerous ‘Transition Towns’ in America. A link available at arborday.org/bulletins can show you the communities that have established offshoots of these nonprofit organizations and guide you to their founding bylaws.

- *If we wait for the governments, it will be too little, too late.*
- *If we act as individuals, it will be too little.*
- *But if we act as communities, it might just be enough, just in time.*

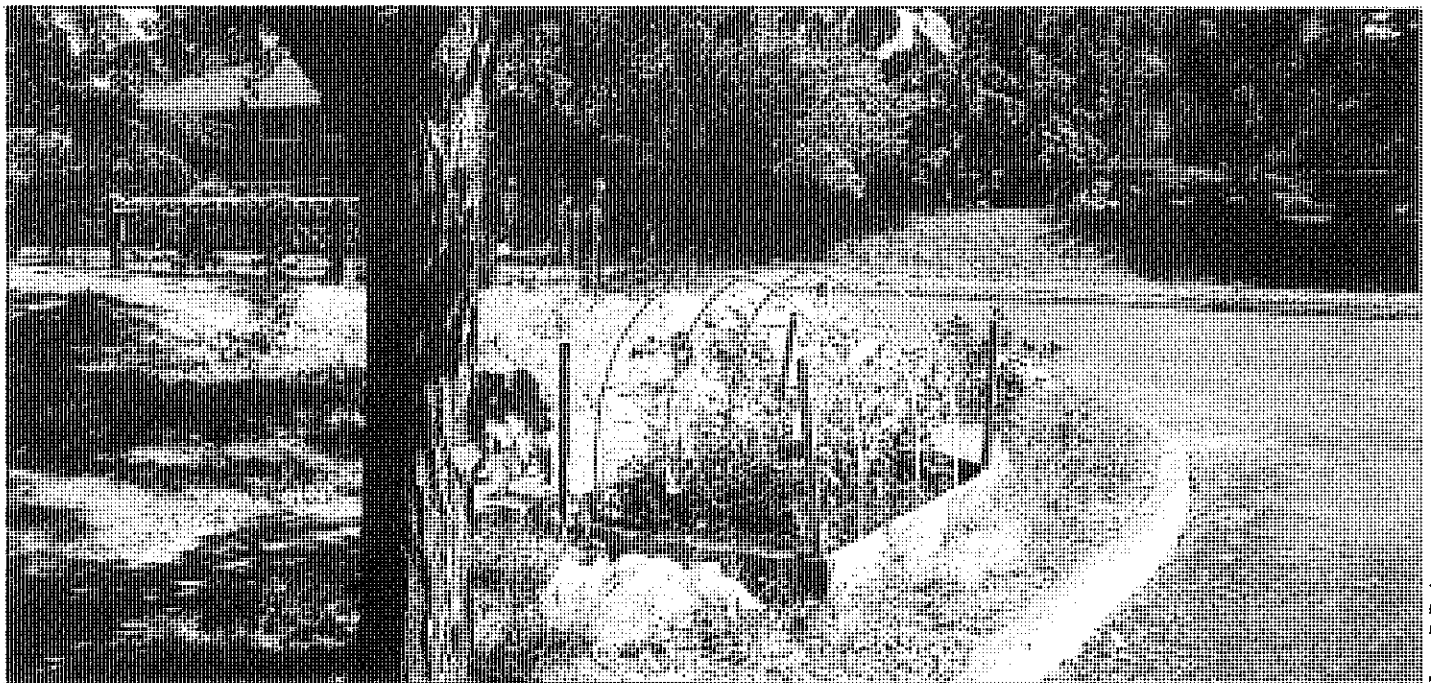
– Transition US

A Positive Approach

The permaculture philosophy in its many forms represents a positive approach to dwindling resources, climate change and the need for sustainable strategies. Within tree boards, consideration can be given to how the principles of permaculture might be incorporated and communicated within the community. Another positive action is to review ordinance provisions to make certain none inhibit small-scale farming, community gardens, fruit trees in public areas and other activities that promote self-reliance. Also, master plans can be drawn to support walking, bicycling, and protection of green areas in all their forms.



Actions in support of permaculture may help your community qualify for a Tree City USA Growth Award.



An innovative homeowner takes advantage of a spacious tree lawn to plant garden crops in a raised bed. The city's ordinances provide no restrictions on this use of the right-of-way.

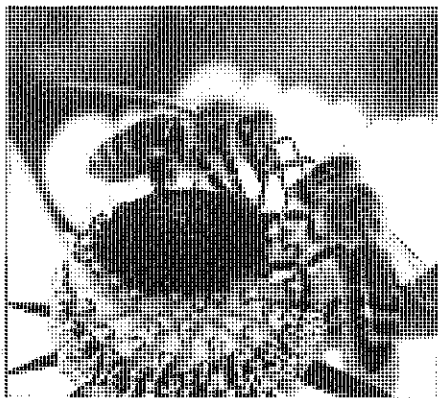
James R. Pazio

To Bee or not to Bee

For successful urban orchards, forest gardens, or even a single fruit tree, pollinators are essential partners. Bees can do the job while at the same time providing honey as one more local source of food. The problem is that bees in urban areas can be a source of conflict. Some communities have restrictive ordinances; others encourage beekeeping or have minimal requirements. A first step to beekeeping is to check the local law. Next, be sure your site is appropriate for beekeeping. For example, if you have a neighbor with a bee sting allergy, or if your lot is extremely small and you have no roof-top opportunity, it is probably best to let someone else's bees do your pollinating. After all, bees in the city commonly range up to 1 1/2 miles in search of nectar, so hopefully some will travel your way. If you do decide to keep bees, here are some tips to help make it safe and also keep peace in the neighborhood:

- Keep your bees happy (or at least less grumpy) by placing hives in a sunny but wind-sheltered place and facing the morning sun.
- Make sure the flight path near your hives is unobstructed and away from walks, driveways, play areas or other points of potential conflict. (Hedges and fences 5 - 6 feet high can be used to direct flights).
- Keep the number of your hives in proportion to lot size. A good guide in developed areas is: 2 colonies on a 1/4-acre lot; 4 on property up to a 1/2 acre; and 6 on an acre.
- Seclude and/or fence the hives to keep children away.
- Provide a source of constant water to keep bees from frequenting a neighbor's swimming pool. A bucket of wet sawdust or wet sand around the edge of a bird bath near the hives works well.
- Avoid working with your hives at times when neighbors are likely to be outside.

With proper hive management and a little consideration, honey bees can be an unobtrusive and productive part of



the urban ecosystem. After all, they are far more interested in doing their helpful work than in stinging people. A little educational effort with neighbors and community leaders can go a long way toward keeping bees at work in our communities.

Additional Information

The history, philosophy and strategies of permaculture are fascinating. There is a wealth of available material and training programs available to help guide homeowners, tree boards or professional managers in implementing permaculture. For sources of more information, please visit arborday.org/bulletins and click on Bulletin No. 59.

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