



EDIBLE FOREST GARDENS

A PERENNIAL AGRICULTURE ALTERNATIVE

By Ron Berezán

When English horticulturalist Robert Hart set out in the mid-1960s to create a healthy and self-sufficient lifestyle for himself and his handicapped brother, he purchased a few acres of land in Shropshire near the Welsh border and began to farm.

Within a few years, however, Hart realized that neither he nor his brother had the physical stamina to manage the intense needs of the annual vegetable cropping systems that they had developed. An avid reader and cross-cultural researcher, he turned his attention to other less labour intensive agricultural models, particularly the famed “home gardens” of Kerala state in India.

In his visionary book, *Forest Gardening: Cultivating an Edible Landscape*, Hart notes that Kerala boasts an estimated half million small-scale forest gardens managed for subsistence and income by the millions of people that live within them. Hart’s research revealed that these tropical gardens, typically half an acre (0.8 ha) in scale, had up to “23 young coconut palms, 12 cloves, 56 bananas, 49 pineapples, 30 pepper vines and numerous other herbaceous perennial plant species and small livestock.” With little or no outside inputs, such intense production could supply most of a family’s food needs

plus medicine, animal fodder, building materials, feedstock for micro-biogas digesters and fibre for crafts. Similarly, Hart discovered that forest gardens on the island of Java of just over an acre in size were routinely supporting families of ten or more persons.

Over the next thirty years, Robert Hart and his brother began to transform their own property into perhaps the first known temperate forest garden in the west. Although Hart passed away in 2001, his garden remains an inspiration to would-be forest gardeners around the temperate world as he has demonstrated that the agro-forestry principles practiced for hundreds, if not thousands, of years in the tropics can be successfully adapted to colder climates.

In the past decade or so, interest has been growing in the forest gardening model throughout North America with many exciting examples coming to light. While much of this work is still experimental, American David Jacke, in *Edible Forest Gardens: Ecological Vision and Theory for Temperate Cli-*

mate Permaculture has effectively presented both the possibilities and the technical requirements for forest gardening in the northern hemisphere.

Intrigued by the work of pioneers like Robert Hart and David Jacke, I became determined to develop my own forest garden for our Edmonton home. In partnership with my neighbour, we have converted approximately 2200 square feet (204 m²) of our yards into a joint Zone 3 edible forest garden. The work began in June of 2008 with the sheet mulching of large areas of lawn and former vegetable beds with layers of organic matter including cardboard and newspaper, compost, grass clippings, leaves, straw, alfalfa pellets and bark chips. Then the work of planting began.

A well-designed forest garden can eventually out-produce an annual cropping system in food calories per unit of area with far less labour.

The principles

Succinctly put, edible forest gardens are “perennial polycultures of multi-purpose plants powered by the sun.” Following the patterns and ecological functioning of established forests, we are attempting to create stable, resilient and diverse systems that require few outside inputs and are highly productive in relation to the amount of labour required. To be clear, these gardens are not an attempt to replace existing natural



The work began in June of 2008 with the sheet mulching of large areas of lawn and former vegetable beds with layers of organic matter including cardboard and newspaper, compost, grass clippings, leaves, straw, alfalfa pellets and bark chips.

forests. Rather, we are developing parallel forest systems that can provide a wide range of yields to people, while at the same time offering back numerous ecosystem services such as carbon sequestration, wildlife habitat, soil building, the creation of microclimates and water retention.

Forest garden design depends on the careful mimicry of natural forest systems. One of the core

principles articulated well by Robert Hart is that forest architecture is typically multi-layered with a variety of plants occupying niches at different heights: tall trees, small trees, shrubs, herbaceous perennials, ground covers, vining plants and the root zone. There is a careful selection and placement of all species such that functional communities, or guilds, of plants that support each other

Ron Berezan's Edible Forest Garden in Edmonton, Alberta

Trees

Evans Cherry (*Prunus cerasus* 'Evans')
Brook Red Plum (*Prunus salicina* 'Brook Red')
Filazel (*Corylus* X hybrid)
Honey Crisp Apple (*Malus domestica* 'Honey Crisp')
Ure Pear (*Pyrus ussuriensis* 'Ure')

Espalier fruit trees

Norda Apple (*Malus domestica* 'Norda')
Fall Gold Pear (*Pyrus ussuriensis* 'Fall Gold')
Golden Spice Pear (*P. ussuriensis* 'Golden Spice')
Brook Gold Plum (*Prunus salicina* 'Brook Gold')
Evans Cherry (*Prunus cerasus* 'Evans')

Shrubs

Saskatoons (*Amelanchier alnifolia*)
Red Currant (*Ribes rubrum*)
Black currant (*Ribes nigrum*)
Missouri Currant (*Ribes sativum*)
Gooseberry (*Ribes uva-crispa*)
Josta Berry (*Ribes nigrum* X *uva-crispa*)
Honeyberry/Haskap (*Lonicera caerulea edulis*)
Romance Cherries (*Prunus cerasus* X *fruticosa*)
Western Sand Cherry (*Prunus besseyi*)
Raspberries (*Rubus* spp.) – contained area

Herbaceous perennials

Bee Balm (*Monarda fistulosa*)
Giant Hyssop (*Agastache foeniculum*)
Meadow Blazingstar (*Liatris ligulistylis*)
Betony (*Stachys officinalis*)
Garden Sorrel (*Rumex acetosa*)
Good King Henry (*Chenopodium bonus-henricus*)
Lovage (*Levisticum officinale*)
Sweet Cicely (*Myrrhis odorata*)
Valerian (*Valeriana officinalis*)
Comfrey (*Symphytum officinale*)
Stinging Nettle (*Urtica dioica*)
Bloody Dock (*Rumex sanguineus*)
Salad Burnet (*Poterium sanguisorba*)
Garden Hyssop (*Hyssopus officinalis*)
Chives (*Allium schoenoprasum*)
Garlic Chives (*Allium tuberosum*)
Welsh Onions (*Allium fistulosum*)

Egyptian Onions (*Allium X proliferum*)
Wild Onions (*Allium canadense*)
Sage (*Salvia officinalis*)
Lupins (*Lupinus polyphyllus*)
Alfalfa (*Medicago sativa*)

Self-seeding annuals

Borage (*Borago officinalis*)
Calendula (*Calendula officinalis*)
Feverfew (*Tanacetum parthenium*)
Bachelor's Buttons (*Centaurea cyanus*)
Orach (*Atriplex hortensis*)
Dill (*Anethum graveolens*)
Caraway (*Carum carvi*)
Fennel (*Foeniculum vulgare*)
Cilantro (*Coriandrum sativum*)
Buckwheat (*Fagopyrum esculentum*)
Assorted lettuces (*Lactuca sativa*)

Ground covers

Wild Strawberry (*Fragaria virginiana*)
Domestic Strawberry (*Fragaria vesca*)
Creeping Thyme (*Thymus pulegioides*)
Red Clover (*Trifolium pratense*)
Lemon Balm (*Melissa officinalis*)
Mints (*Mentha* spp.)
Canada Violet (*Viola canadensis*)
Oregano (*Origanum vulgare*)

Fungi

Oyster mushrooms (*Pleurotus ostreatus*)
Shiitake mushrooms (*Lentinula edodes*)
Horse mushrooms (*Agaricus arvensis*) * volunteer



are created. These guilds may include:

- soil-building species, such as legumes (clovers, alfalfa, lupins, vetch, caragana, sea buckthorn, buffalo berry),
- “dynamic accumulators” (plants such as comfrey, valerian, dandelion, nettles, yarrow, linden trees and others known to accumulate sub-soil nutrients),

We designed an edible forest garden to mimic the mid-succession woodland.

- insectary plants for attracting pollinators and other beneficials,
- aromatic species to confound pests, and
- “nurse plants” that grow up quickly to shelter younger more vulnerable species.

Our forest garden

In our Edmonton garden, the layout centers around five key guilds, each comprised of one tree, four to six shrubs, numerous perennial ground covers and self-seeding annuals. These “nodes” are arranged in a large semi-circle opening to the south, thereby creating a warm, sunny micro-climate in the centre for annual vegetables and herbs.

A sixth node occupies a partially shady area on the north side of the house. Several currants, gooseberries and josta berries, along with shade-tolerant perennials and ground covers (lemon balm, mint, Canada violet), make up this guild. In this moist, shady area, we have also inoculated the mulch with oyster mushroom



A line of espaliered fruit trees with a diverse understory forms the western border of the garden.

spawn. Other areas of the garden have been inoculated with shiitake mushroom spawn. A line of espaliered fruit trees with a diverse understory forms the western border of the garden.

Temperate forests, like all landscapes, are not static and move through a series of stages or successions over time. What began as a meadow will evolve into a thicket, followed by early, mid and late succession woodlands, and finally old growth forest in which a

few tall species dominate until fire starts the process all over again.

Forest architecture is typically multi-layered.

David Jacke observes that forests in the mid-succession stage offer the greatest diversity of species due to their mosaic texture and the fact that there is still sufficient light penetrating through the



Functional communities, or guilds, may include insectary plants for attracting pollinators and other beneficials.

canopy layer to support a lush understory. Hence, we design an edible forest garden to mimic the mid-succession woodland in which the tree layer covers only 50–75% of the overall surface area. This means that the spacing between trees in a forest garden will usually be farther apart than in an orchard, which is not typically concerned with a diverse and productive understory.

In the early years of forest garden development, there will be larger open spaces which allow for the placement of annual vegetable crops and self-seeding annual species for other purposes. Many of these species will recede from prominence as the woodland evolves towards mid-succession resulting in more shade. Once the guilds have been planted, the role of the forest gardener is to ensure that the more aggressive species do not overwhelm the slower growing ones. Hence in our two-year old forest garden, the main labour is currently to “chop and drop” the fast-growing species such as alfalfa, clover, comfrey, valerian, borage and orach, adding to the mulch layer as we go.

What was once a rather sterile lawn is fast becoming a diverse ecosystem and an oasis of biodiversity for countless soil organisms, bees, butterflies, birds, fungi and other life forms that dwell on the site.

Biodiversity and bounty

During our first season, harvests were limited primarily to fast-growing edible perennial greens, some strawberries and herbs, and annual vegetables planted in open spaces. Two years later, now our third season, we are also enjoying

Forest garden design depends on the careful mimicry of natural forest systems.

a substantial harvest of berries, fruits, medicinal plants and edible mushrooms. The beauty of this model is that we are harvesting something from the garden from late April until early October. The future productivity of this system





“The forest garden...supplies people’s spiritual needs by its beauty and the wealth of wildlife that it attracts.” —Robert Hart

is fascinating to contemplate and forest garden advocates like Hart and Jacke suggest that even in temperate zones, a well-designed forest garden can eventually out-produce an annual cropping system in food calories per unit of area with far less labour.

Perhaps the greatest delight thus far, however, has been to observe the evolution of ecological activity within our now thriving garden. What was once a rather sterile (and struggling!) lawn is fast becoming a diverse ecosystem and an oasis of biodiversity for countless soil organisms, bees, butterflies, birds, fungi and other life forms. This is the beauty of the forest garden model: while providing for our own needs, we are simultaneously regenerating soil, capturing water, turning carbon dioxide into biomass and creating habitat for a host of other creatures. As Robert Hart observes, “The forest garden is far more than a system for supplying

mankind’s material needs. It is a way of life and it also supplies people’s spiritual needs by its beauty and the wealth of wildlife that it attracts.”

While it is unlikely that forest gardens and other forms of perennial agriculture will ever completely replace our annual cropping systems, they represent a promising complementary vision for a truly sustainable and regenerative approach to meeting our essential needs and regenerating ecosystem health. From urban yards to acreage and farm-scale installations, we have only begun to explore the possibilities for forest gardens as a model for reweaving ourselves into natural systems.

Ron Berezan operates The Urban Farmer, an organic gardening, edible landscaping and permaculture design service serving western Canada (www.theurbanfarmer.ca). Ron

has a particular interest in alternative models for growing food in cities and has compiled a database of over 200 species suitable for Zone 3 forest gardens. In the winters, Ron organizes trips to Cuba for Canadian farmers and gardeners to visit organic farms and urban agriculture projects (see ad below).

Photo credits: Ron Berezan

References

Forest Gardening: Cultivating an Edible Landscape, Robert Hart. Chelsea Green Publishing Co. 1991.

Edible Forest Gardens: Ecological Vision and Theory for Temperate Climate Permaculture, David Jacke with Eric Toensmeier. Chelsea Green Publishing Co. 2005.



Organic Cuba 2011

Jan 31 – Feb 14 OR Feb 21 – Mar 7

- ☛ Come face to face with the leaders of Cuba’s agro-ecological revolution!
- ☛ Visit organic farms, urban agriculture sites and permaculture projects!
- ☛ Explore the rich culture, natural beauty, and amazing diversity of Cuba!



A professionally guided and organized tour for the alternative, organic traveller
Visit www.theurbanfarmer.ca or call 780.221.4800 for full details




The Edible Forest Garden that Jay Tomczak and helpers created on the site far exceeds any picture I ever conjured in my head. While the planting is just over a year old, it is an incredible collection of plant material with an inviting and creative layout. It is indeed an inviting food labyrinth. Not concentric rings, but paths and pockets, spaces and guilds that will take years to develop. It captures the imagination of most everyone that hears about it or walks through it. *Edible Forest Gardens* is an ambitious two-volume work whose influence should extend well beyond ecologists and permaculturists and, in the best of all outcomes, reach into the mainstream. Volume one lays out the "Ecological Vision and Theory for Temperate Climate Permaculture," and it also includes a very useful analysis of existing forest gardens (one only 50 by 90 feet) and a tantalizing 30-page appendix of "top 100" species.