

Don't Plant Trees!!
Plant Ecosystems!!!

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What is a Forest Garden?



- A forest mimic:
forest as design metaphor
- A consciously designed ecosystem
- A perennial polyculture of multipurpose plants.
 - 3 - 3,000+ year life spans
 - Many species in each patch
 - Each species with at least three uses or functions, including:

Food	Fodder	Farmaceuticals
Fuel	Fertilizer	Fun
Fiber		



Not All Forest Gardens are Forests



Design Multifunctional Habitats



Charlie Headington and Deb Seabrook, Greensboro, NC

A Rooftop Forest Garden

www.risc.org.uk



Ecosystem Mimicry

- Mimicry: the close external or functional resemblance of a species, system, or object to another, often evolving so as to obtain ecological or adaptive advantages.
- What do we mimic from natural ecosystems?
 - ✓ Properties (aims)
 - ✓ Principles (strategies)
 - ✓ Patterns (structure)
 - ✓ Processes (function)



Emergent Ecosystem Properties

Emergent Properties: properties emerging from the interactions between components of the system, not from the components themselves.

- Stable (consistency of function, inertia, persistence)
- Resilient
- Self-maintaining
- Self-regulating
- Self-renewing
- Self-fertilizing
- Produces clean air
- Produces clean water
- Increases water storage capacity over time (to a limit)
- Increases in biodiversity over time (to a limit)
- Builds soil nutrients, OM, rooting depth, food web
- A good enough start?



We Mimic Forest Ecosystem Structure & Function (Pattern & Process)

- **Architecture: 5 Elements**
 - Layers
 - Horizons
 - Density
 - Patterning
 - Diversity
- **Social Structure**
 - Species Niches
 - Community Niches
 - Food Webs
 - Guilds
 - Polycultures
- **Self-Renewing Fertility**
- **Succession: All Phases**



Architecture:

Soil Horizons

- 6 Horizons:
 - O - Organic
 - A - Assimilation
 - E - Eluviation (leaching)
 - B - Banking
 - C - Chemical/Constitution
 - D - Durable (bedrock)
- ✓ Feed soil from the top
- ✓ Cycle nutrients from below with dynamic accumulators
- ✓ Apples in deep soil produce more & more consistently, live longer, have less pest, disease and drought damage.

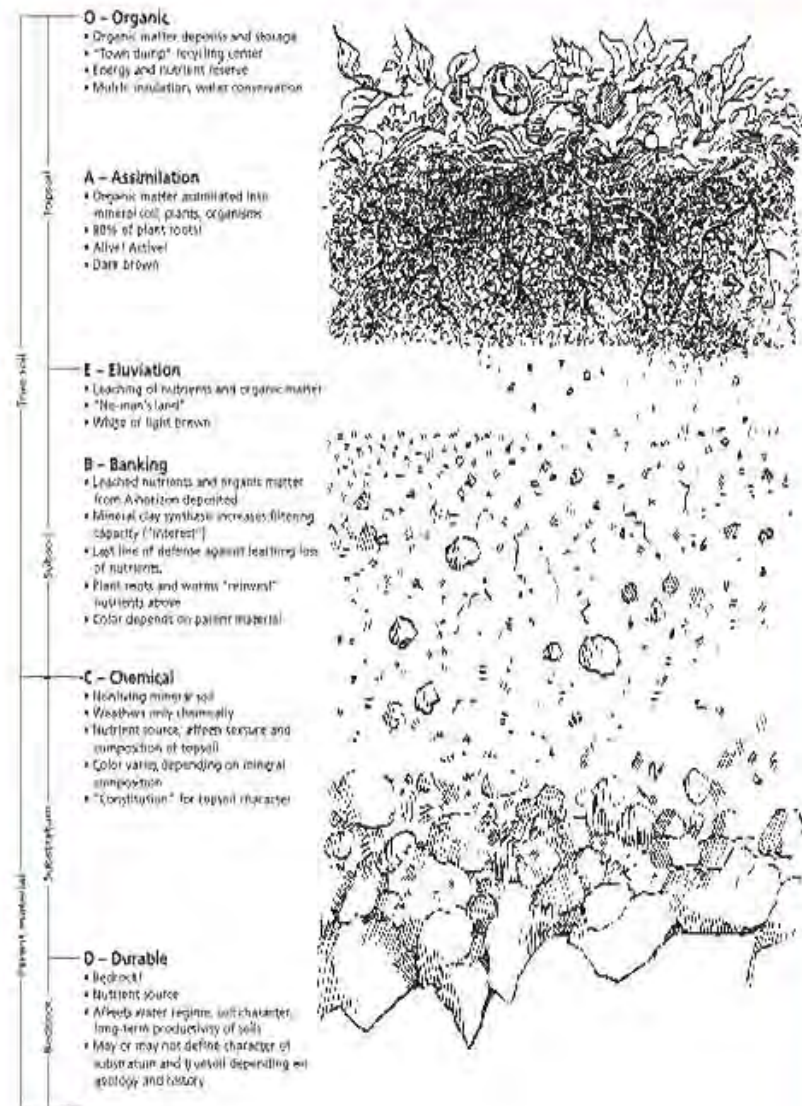


FIGURE 3.6 The six soil horizons and their ecological character and functions.

Architecture:

Vegetation Density: Root Areas



- In deep, moist, or fertile soils, root dia. = 1.5x crown dia.
- In shallow, dry, or infertile soils, root dia. = 3x crown dia.
- ✓ Site conditions should influence plant spacing

Nitrogen Fixers



Wild blue indigo
Baptisia australis

- Gorgeous
- Fixes most N in full sun
- Generalist nectary, invert. foliage habitat
- Full sun to part shade
- Zones 4-8
- 2-4 ft h x 2-5 ft. w
- Best in back border, can fall over after flowering.
- Poisonous!

Dynamic Accumulators

Russian Comfrey, *Symphytum x uplandicum*



- Beneficials: lacewing eggs, parasitic wasp & spider foliage habitat, spider overwintering, generalist nectary
- Sterile hybrid; *S. grandiflorum* = dwarf.
- Zone 6; other sp. zone 4; 1-4 ft. h x w; full to part sun
- A great dynamic accumulator (*K, P, Ca, Cu, Fe, Mg*)

Dynamic Accumulators



French Sorrel, *Rumex acetosa*

- Tasty sour greens
- Accumulates P, K, Ca, Fe, Na
- Variety 'Profusion' never flowers
- Zone 3 hardy
- 1-3 ft h x 1+ ft w
- Sun to part shade

Ground Covers

Prostrate Bird's Foot Trefoil *Lotus corniculatus 'Plena'*

- Great N-fixing groundcover
- Only 1 inch high, dense
- Trample tolerant
- Zone 5



Green and Gold *Chrysogonum virginianum*

- Native specialist nectary
- Semi-evergreen groundcover
- Needs moist soil, sun to part
- Zone 5

Gourmet Decomposers

Wine-cap Stropharia, *Stropharia rugoso-annulata*



Photo: Eric Toensmeier

- Edible mushroom
- Decomposer
- Grows in straw and wood chip mulch
- Easily transplanted to garden
- Native

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Edible Forest Gardens

a book in two volumes.

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Nectary Species

Goldenrods

Solidago spp.

- Excellent specialist & generalist nectar plant
- Considered ornamental in Europe
- Many species for many habitats, even an edible one (sweet goldenrod, *S. odora*)!



New England Aster *Aster novae-angliae*

- Excellent specialist & generalist nectar plant
- Gorgeous!
- Zone 3



Crops



Courtesy Eric Toensmeier

Am. & Asian Persimmon *Diospyros virginiana, kaki*

- Nutritious and tasty fruit
- Few pests and diseases
- Thrives in poor dry soils
- Taprooted, suckering
- Hybrids: better size, flavor, hardiness



Courtesy One Green World

Crops

Pawpaw

Asimina triloba

- *Exotic tropical look*
- Delicious, creamy, pear-avocado-flavored fruit
- Fruits reasonably in shady understory (better in sun)
- Highly pest resistant
- Native
- Tap- or heart rooted
- Zone 5
- 20-35 ft h x w
- Sun to full shade
- *Juglone tolerant!*



Crops

Hardy Kiwifruit, *Actinidia arguta*



- Delicious fruit, high in Vitamin C
- Minimal pest problems
- Heart rooted
- Zone 4 (*A. kolomikta* zone 3)

Crops

Sea Kale, *Crambe maritima*



Photos: Eric Toenemeier

- Edible shoots, leaves, broccoli
- Long-lived, taprooted perennial, zone 4
- !!! Cream-white flowers

