

Constructing the Food Forest Orchard

by Larry Santoyo

To construct a productive forest system we assemble plants and animals in "guilds" that create a functionally harmonic effect. Harmonic effects are those that, by putting two or more elements together, will result in benefits not produced by themselves alone higher production, reduced pest or predator problems or maintenance of soil fertility. Every plant and animal in a guild has a function.

The main element in a guild will be supported by plant(s) or animal(s) serving the functions of, at least, available nutrient fertilizer, soil building or pest control. Choosing elements for guild associates is done mainly through observation of naturally occurring plant and animal associates and then through trial and error based on these assemblies.

- **Designing the Food Forest**

Observing and cataloging natural associations in the wilds near the proposed forest area (with a similar aspect and orientation) is the most appropriate way of determining plant and animal assemblies for any site. Guild association trials can begin by reconstructing or mimicking these associations and conditions 1) by using the same elements (genus and species). 2) by substituting a more productive or palatable species (same genus with a select species and or cultivar) 3) by substituting genus and species in the same family 4) through substituting family, genus and species based on the natural functions of each element (careful observation and research is required) or 5) by combining all of these strategies.

- **Food Forest Trials**

A natural assembly may consist of: a high canopy of fir, with alder, elderberry and saskatoon berry as a middle canopy with gooseberry, snowberry, hemlock, mint and violets in the understory and ground cover. A closer look will reveal several insect species and fungi. Over time the occasional game bird will come to forage and deposit phosphates and nitrogen. Deer will browse and also leave fertilizer. Fish and small animal carcasses left by marauding coyotes, raccoons and skunks may also be found.

By recreating the interactive elements of this naturally occurring model, we can begin to construct another highly productive system more suited to harvest and human sustenance.

Alder (*Alnus*) is a nitrogen fixing deciduous tree it produces large quantities of biomass and nurses young trees. Substituting another tree (such as *Caragana* arborecence or *Eleagnus* species) to serve the same function may be less invasive (with free range poultry), provide more benefits and require less water

in the new food forest as well as provide excellent bee and poultry forage.

Saskatoon berry (*Amelanchier alnifolia*) is a native fruit used fresh, dried and for making pemmican. Selected varieties of Saskatoon (Pembina, Smoky or Northline) produce large berries and less sucker growth than native species. Saskatoon produces a pome fruit like the apple and pear in the Rosacea family. Apple and pear trees can therefore be added or substituted. There are some trials that are grafting apple varieties onto Saskatoon root stock. (This has been successful on native crab apple).

- **Fruiting Understory**

Gooseberry (*Ribes*) produces a tart fresh fruit and because of its thorny nature reduces browse. Several selected varieties of gooseberries produce a larger more prolific and sweeter fruit. Red and Black Currants (another *Ribes*) can be substituted. Many *Ribes* species are known to deter white flies. *Viburnums* and *Vacciniums* can also be included.

- **Ground covers**

Natural ground covers can be used or substitute functions with nasturtiums and marigolds to control soil nematodes. Strawberries or mushrooms are also possible. Comfrey, vetch and yellow clover mowed early spring and mid to late summer provide trace minerals, mulch and nitrogen. No tilling of mulch crops is recommended.

- **Insectary Plants**

Umbelliferous plants (dill, anise, carrots left to seed) mimic hemlock and other small flower plants. Umbels and rosacea provide habitat for wasps, who provide predatory insect control.

- **Vegetable Cropping**

Harvesting and marketing vegetable and berry crops is an ideal way to produce a yield while the trees of the forest/orchard mature. Edges of forests and strips along the solar edge of the constructed food forests provide excellent areas for annual vegetable growing. Minimal tilling is optimum. Any tilling should occur outside of tree rows (dripline).

- **Soil & Site Preparation**

Soil preparations and inoculates are essential for productive food forests. Recommendations for site preparation includes importing mass quantities of organic matter. Site can be planted on raised mounds or in swales along the contour. One foot deep or more of rotted alfalfa hay topped with one foot of manure can be added - as wide as the mature trees. Application of kelp for organic matter and trace minerals would also be ideal. Green manuring or mowing cover crops could follow after three to five years as soil maintenance. Use soil from nearby or model forest to inoculate new site. Soil microbes from Oak stands work well for establishing Walnuts (and vice versa). Legume cover crops may also need suitable inoculates (from established fields or purchased).

- **Livestock**

Animals are essential to any forest system especially constructed food forests with an abundance of fruit. Animals need not be harvested for food but must be included in any balanced system populations must be monitored. Game birds and poultry should be encouraged or reintroduced. Late season free ranging animals can convert fallen fruit, slugs, and insect larvae into harvestable chicken, turkey or geese. Pigs and sheep can also be used (with more attention and fencing). Goats should be avoided. Deer browse can be effectively

controlled by exclusionary fencing either the entire site or around each individual tree. The presence of hunters and dogs significantly impact deer patterns and habits.

Recommended Food Forest Associates

Apple, Mulberry, Pear and Walnut₁

Ribes and Viburnum species

Comfrey, Vetch and Clover

Pecan, Walnut and Oak₂

Wild Plum and Apricot

Chamomile and Thyme

Hackberry, Walnut₃

Ribes species

Natural Forest Associates₄

Western Red Cedar, Western Hemlock, Grand Fir

Twinflower, Big Huckleberry, Utah Honeysuckle, Paxistima

Oakfern, Wild Ginger, Violet

Western Red Cedar, Western Hemlock, Grand Fir, Douglas Fir, White Pine

Big Huckleberry, Thimbleberry, Oregon Grape, Douglas Maple

Wild Sarsparilla (in Bracken Fern areas)

Other Possible Food Forest Associates

Hazelnut / Apricot

Black Cherry / Locust

Chestnut / Sassafras

Oak / Mountain Mahogany

1 Practical Guide to a Sustainable Future, Bill Mollison, Island Press

2 Observed in Central Texas

3 Observed in Northern New Mexico

4 Observed in Eastern Washington