

Agro-Forestry and Silvo-Pasture systems:

A general term for the intentional incorporation of perennial *woody* species into existing field or production systems. Also, entire fields and farms can be planned in the initial stage as an agro-forestry installation.

The integration of production systems (trees and crops) can boost production by achieving an efficiency of nutrient cycling, providing a wind break for sensitive plants, nitrogen fixation, and reduction of evapo-transpiration via shade (on dry sites).

Permanent roots and shoots in a field of annual plants affects soil microbiology in positives ways, catches erosion, helps groundwater recharge, accumulates mulch and cations. For pasture, there are similar benefits + shade and forage for animals

Trees and Shrubs may also be crops. Whether it's a farm managed with equipment for annual production of (grain, vegetables, or tubers) nuts fruit, timber, and green-manure trees can be included on a wide-spacing. Diversity on the farm means diversity of income for the farmer.

The tropics: Agro-forestry is well-developed due to constancy of weather, high rates of photosynthesis, necessity of cycling nutrients + high costs of chemical fertilizer coupled with low cost of labor. Besides that, countless species of tropical trees are very good for alley cropping and silvo-pasture systems.

Temperate climates: seasonality of production & light cycles (winter/summer) has probably made farming more conservative + fewer sources of food species. Plenty of promise !!

Trees and Livestock

Electric fencing is ideal for early protection of trees before they grow above the browse-line. Their benefits extend from then on. Be careful of compacting the roots of trees!! Rotationally grazing animals and applying BMP's for stocking rates is essential for success of Silvo-pasture systems and ensuring maximum cycling of soil nutrients and increasing fertility of the land.

it's best to plan your field than to just turn livestock into forest, this is NOT silva-pasture, it's land destruction. Often animals get sick from eating poisonous species and the native plants of a forest will rarely grow back after grazing. Most grazable grasses, legumes and forbs are of Eurasian varieties adapted to heavy pressure from sheep and cows, they have strong roots that resist soil compaction and regular soil disturbance. Releasing animals without intentionally improving forages, rotating pastures and using rules of stocking rates is essential.

Frost-seeding: throw clover and shade-tolerant grass seed in the fall or late winter when freezing and thawing proveds them with good soil contact. Clovers, Trefoil, orchard grass, timothy, fescue to name a few. I'd go into this in better detail but there's only 10 more minutes to get this handout to the OGS co-ordinators, =^0 !!

Plants List: Animal Forages that are also Nitrogen Fixers for green manuring 'crop trees':

Black Locust, thorny when young, beloved by cows and goats maintain high protein all summer.
Honey Locust (*Gleditsia triacanthos inermis* -- *thornless, often podless (the pods are GREAT forage in autumn but podded trees have huge thorns)* *Gleditsia triacanthos*.)

Siberian Pea Shrub: 20' high tree or a shrub when grazed or trimmed. Good for animal fodder, less thorny. beautiful yellow flowers. Seeds are edible for chickens, too & people (when boiled)

Russian Mulberry, great and nutritious animal forage, highly coppice-able, non-N fixer

Some Crop Trees:

Red Mulberry, as Russian, leaves not as nutritious. Female trees make delicious nutritious fruit.

Persimmon, one of the best pasture trees: too many benefits to list (listen to presentation:)

More: Chestnuts, Hazelnuts (south slopes) Apples, Pears (north slopes) Autumn Olive, Seaberry,

Shrubs for understory: shade tolerant for understory: currants, gooseberries, cane fruits (south side of tree rows) chokeberry (make sure not poisonous for livestock)

Experimental trees: many news one coming from Eurasia and siberia all the time.

Timber production:

Black locusts, pines, oak, many trees can be grown on a long cycle for timber production. Black walnut and cherry are some of the most profitable species for cutting as saw logs for woodworking/furniture.

These can be planted densely, thinned early to encourage the best ones.

WHOLESALE NURSERIES

Finch Blueberry Nursery, Bailey, NC ~bare-root Blues from \$2-5 apiece)

Lawyer's Nursery, MT ~search by Latin, Shipping is kinda \$, with lots of N-fixers and uncommon trees)

New Farm Supply, Iowa ~Chestnuts, Apples, small fruits

Forest AG, Wisconsin ~ Mark Shepherd's nursery at Forest Farm Enterprises ; Hybrid Hazelnuts, Chestnuts, Korean Nut pine and more)

Burnt Ridge Nursery, WA ~Big diversity of permaculture plants, middling prices, good quality stock, professional, friendly staff. All grows in WA, some experimental in the East

Willamette Nursery, OR ~\$1 rootstock of apple, pear, cherry, peach and more

F.W. Schumacher, MA "Tree and Shrub seed for Nurserymen and Foresters since 1926"
NOURSE FARMS, Inc, MA ~medium prices but very good quality can fruits,

State Nurseries: NC, TN and Missouri ~Highly recommended for purchase of seedling mulberry, persimmon, black locust, honey locust. other edibles of uncertain genetics

RETAIL NURSERIES

Local is great! plant potted trees almost any time of year

Small family operated nurseries, look around! Improved varieties of black walnut, pecans, hickories are available in nurseries all over TN and Kentucky, retail and wholesale

Suggested Reading:

Enriching the Earth, Vaclav Smil, goes deep into the Nitrogen cycle, the history of the Haber/Bosch synthesis of chemical fertilizer and its implications

Restoration Agriculture, Mark Shepherd. a must-read in order to understand the mission of this type of farming system and one man's 17-year efforts to practice it.

All Flesh is Grass, Gene Logsdon. the best book you can read to understand farming in general: cows, corn, pasture, the classic american (midwestern) farm; their crop rotation.

Changes in the Land, William Cronon. 1984, about changes in Ecology from Indian to European settlement. Helps to understand ecology and farming. Unite the two and we have: agro-ecosystems ! The indians were on to something with their forest management... but with improved tree crops, rotating annual production, domestic animals and modern technology...we have a **farm-scale permaculture**.

Tree Crops: A Permanent Agriculture: J.Russell Smith. This is an old book, but helpful to understand that are NOT THERE YET. this fellow encourages us to improve genetics and plant these edible trees not only for ourselves, but for fattening the animals that american rely on so much for food!

Growth of the Soil, Knut Hamsen. Totally random selection for you. Fiction. Colloquial norwegian countryman conquers the wilderness, improves the land (he thinks).