North Florida Sustainable Agriculture – Some thoughts and resources

Goal: Sustainable food production modeled on natural ecosystems.

Things to Get Away From:

- Monoculture
- Annuals
- Regular Tillage
- Heavy dependence on external inputs of chemical fertilizer, pesticides, fossil fuel energy
- Highly centralized food production

Directions to Move Towards:

- Polyculture
- Perennials
- No-Till (or minimal tillage)
- Largely self-sufficient in fertilizer & energy, relying on ecological principles for pest control
- Decentralized and 'human scale'

Monoculture vs. polyculture: Mimic the diversity of natural ecosystems with a diverse array of species filling complementary ecological niches. Much harder for pests/diseases to spread from plant to plant when there genetic diversity from one plant to the next, and there are other species in between individuals. Diverse crop base hedges your bets against variable weather, distributes harvest throughout year.

Annuals vs. perennials: What would happen if you plowed your garden and then left it alone? Natural succession: first, annual weedy colonizers of disturbed ground. Later, a more stable system of longer-lived plants (trees, mostly) takes over. Standard agriculture is a constant battle against this process, constantly setting back succession to its primary stage by plowing and herbiciding. Consequently, massive energy input, erosion, 'burning up' of organic soil matter by oxygen exposure. Planting fruit and nut trees mimics the natural process -- let's ride with succession instead of battling it!

No-tillage: Nobody plows the soil every year under the oak trees in the forest, and they don't seem to be suffering for it! In forest or prairie, soil is enriched primarily by organic matter falling from above. Mulch: Sheet mulch in closely tended garden areas, donut mulch around trees.

Self-sufficient in fertilizer: Nitrogen-fixing and biomass plants as a source for mulching crop plants. Produce fertility right on site (although for now, woodchips and bagged leaves readily available) Make organic ag more sustainable by reducing/eliminating the need to bring in heavy, bulky soil amendments, which are often transported with fossil fuel energy.

Decentralized: Have fruit trees & vegetable gardens where people live and work. Re-connect people with where food comes from.

Plant Sources, and People and Places Doing Great Work

The Land Institute (www.landinstitute.org): Based in Kansas. Working on replacing standard Midwestern annuals-in-monoculture ag with a system based on the native ecosystem in their area, tall-grass prairie. Developing perennial crops to fill all the ecological niches of tallgrass prairie: warm season grasses, cool season grasses, legumes, plants in the sunflower family. Perennial polyculture.

Badgersett Research Farm (www.badgersett.com) Working to replace the corn and soybean monoculture of their area (Minesotta) with perennial woody crops, mimicking the native savannah ecosystem. Have developed high-yielding, precocious hazel nut and chestnut varieties. Hazel could replace soybeans (including for sustainable diesel fuel), and chestnuts are nutritionally very similar to corn.

Seed Savers Exchange : (www.seedsavers.org) A network of home gardeners who grow and maintain heirloom vegetable varieties. Annual membership allows you access the the network, so you can offer and request seeds.

Nolin River Nut Nursery: (www.nolinnursery.com) An excellent source for many varieties of grafted nut trees, and a few fruit varieties.

Just Fruits and Exotics: (www.justfruitsandexotics.com)Located in Crawfordville. Good selection of perennial edible plants, including olive varieties that reportedly do well in North Florida.

Edible Landscaping nursery: (www.eat-it.com)Good catalog, good selection of food-producing plants. Prices are not cheap, but for some varieties they seem to be the only supplier.

ECHO (www.echonet.org) Located on North Fort Myers, Florida. Devoted to fighting world hunger by helping people feed themselves. Promoting sustainable agriculture that relies on a minimum of technological or economic resources. ECHO supplies seeds, plants, and information. Many seeds are available for mail-order from their website, including the amazing moringa tree.

Pawpaw Foundation (www.pawpaw.kysu.edu) The world's only full-time breeding project on Asimina triloba, the pawpaw, North America's largest native tree fruit.

Peters Seed and Research: (www.pioneer-net.com/psr)Vegetable and grain seeds. Located in the Pacific Northwest, which might not recommend varieties adapted to that climate for our conditions. BUT – they actually offer a few selections of perennial grains, probably the only commercial source to do so. The perennial sorghum varieties probably have a good chance of doing well in Florida. (Note: as I put this handout together, the website was down. Hopefully this is just temporary!)

Recommended Books

"**Breed Your Own Vegetable Varieties**" by Carol Deppe. An outstanding, inspiring book that shows us how much power we have as home gardeners and seed-savers to select and improve the plants we grow, be they vegetables, fruit trees, or any other plant. She shows how to do everything from very consciously directed breeding programs, to simply being aware of how your growing conditions will adapt your variety over time to your conditions.
Example: Deppe was doing a pea breeding project over several years. In her area of Oregon, slugs tend to eat the tender growing tips of newly sprouted pea plants. Some of the plants in her breeding population made lots of branching low to the ground, while others focused their energy into growing straight upwards for a while before branching. Slugs don't climb very high, so the low-branching ones were eaten by slugs, while the high-branching types tended to have very little slug damage. So over several generations, only the high-branching, slug-resistant types were still left in the breeding population. Most plant breeders would have just put out slug bait, but because Deppe gardens organically, she automatically succeeded in breeding slug-resistant peas without even having to think about how to achieve that goal.

"**Tree Crops**" by J. Russell Smith. A classic book, first published in the 20's, and then in a revised edition in the 1950's. Long out of print, but you can sometimes find a copy in a library. This book has inspired

generations to work on developing fruit and nut trees. Smith makes a well-reasoned, factual case that plow-based agriculture is the destructor of soils through erosion, and that tree crops are the way out. Covers the possibilities for pecan, hickory, black walnut, persimmon, honey locust, mesquite, sweet acorn oaks, pawpaw, and many more, all in a delightfully engaging style. Makes you shake your head in wonder that so little has been done with this man's ideas in the more than a half-century since this book's publication.

"**Global Gardening**" by Hank Bruce

This book contains profiles of lots of REALLY obscure food-producing plants. Lots of fun reading. Some of the plants covered are readily available; others might require a trip overseas to get!

Plant Profiles

Moringa tree (Moringa oleifera)

Moringa is a fast-growing tropical tree with edible, super-nutritious leaves. It makes a good hot-weather green for cooking (spinach substitute) that is available for harvest all summer, when many other cooking greens are unavailable. Harvest is done by stripping off bunches of leaflets and then pulling out the stems. It is primarily a cooking green; only small quantities should be eaten raw.

The tree generally freezes to the ground every winter in the Gainesville area, but grows back rapidly from the root system once winter is over, frequently reaching twenty feet or more by fall. Harvesting the tender growing tips will make the plant stay shorter and bushier. The plant also makes long seedpods, which can be harvested young for a cooked vegetable, or left to mature on the tree to make seeds to start new plants. Moringa prefers full sun, but will do reasonably well if it gets at least several hours of sun a day. Mulching with leaves in winter will help ensure that it will survive and grow back in spring.

Avocado (Persea americana; cold-hardy types)

Cold-hardy avocadoes include the varieties Del Rio, Wilma, Opal, May, Gainesville, Mexicola, and Teno. Trees grown from cuttings may produce fruit within two to three years; trees grown from seed may take seven to ten years before fruiting. Fruit on cold-hardy types is frequently smaller than commercial varieties, but quite tasty. Fruiting season, depending on variety, is from summer to fall.
Avocadoes prefer full sun for at least part of the day. Planting near buildings or evergreen trees (such as magnolia, live oak, or pine) may offer some cold protection. Avocadoes grow best with regular watering, but they don't like spots where the soil stays saturated with water. Planting sites should be in areas not prone to staying wet.

Muscadine (Vitis rotundifolia)

Muscadine grapes are native to Florida and the Southeast, so they are very well adapted here. Cultivated varieties have larger, sweeter fruit than most wild muscadine grapevines. Muscadines grow as a vigorous vine; growing them on a trellis works well. As with most fruits, they prefer full sun, but can do alright with sun for just part of the day. Fruiting season is August to September in Gainesville.

Okinawa Spinach

Okinawa spinach is an excellent salad green for summer salads in Florida. The leaves are quite tasty and nutritious eaten raw, and the plant produces an abundance of foliage all summer.

If mulched for winter, the plants will sometimes come back from the root system in spring, but this is not entirely reliable in Gainesville and it is best to take some cuttings to keep indoors over winter to plant out in spring. Cuttings can be rooted in a glass of water on a sunny window sill, then put into pots of soil once roots have formed. Plants seem to do well in either sun or shade, although growth may be quite slow in really dark shade.

Pomegranate

Pomegranate trees grow well in Gainesville as long as they are given a sunny spot. Fruit production is from late summer into fall, and fruit tends to be a bit tart compared to commercially available pomegranate fruits.

Pomegranate trees are easily started from cuttings, which can be stuck into a pot of soil, covered with a clear plastic bag, and left in an outdoor spot that is sheltered from direct mid-day sun. In a few weeks, the cuttings should have produced roots.

Chaya

Chaya makes an abundance of greens for cooking all summer; it is a good spinach substitute for hot weather. Chaya is very tasty and is a good source of protein, vitamins, calcium, and iron. The leaves MUST NOT BE EATEN RAW as they contain small amounts of cyanide (just as apple seeds and peach pits do). Boiling for five minutes causes the cyanide to evaporate harmlessly into the air.

The plant does best in full sun, and is very tolerant of drought. Cold-hardiness in Gainesville has not yet been established, but the plants start very easily from cuttings, which can be taken indoors over winter and planted out in spring.

Fig

Fig trees produce delicious, sweet fruit in June and July. They are rapid growing trees that can make some fruit even the same year they are planted. Full sun is best for good fruit production.

American persimmon

American persimmon is a native tree in North Florida which has the potential to be an outstanding fruit for this area. Trees prefer full sun, and will grow in a variety of soil types.
At present, the American persimmon trees we offer are seedlings from good fruiting parents. Because this species comes in male and female trees, half of the seedlings will be male and will make no fruit. For this reason, if you want fruit production, it is recommended that you plant these trees only if you have space to plant several, so that hopefully you will get at least one that turns out to be female.

Loquat

Loquat trees have abundant yellow/orange fruit in late winter to early spring. There are many loquat trees around Gainesville planted as ornamentals. Some have good fruit; some don't. The trees we offer are seedlings of some of the best loquat varieties in existence, and should on average have much larger, sweeter fruit than the average landscape loquat. Plants can take shade, but the more sun they get the better they'll fruit. In some of the colder pockets north of Gainesville, the fruits are subject to damage by late freezes.