

- **Cooperative Strategies for Community-Scale Agroforestry**

- Zev Friedman, Cooperate WNC, March 2022,
www.cooperatewnc.org

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**Village of Yukuyoko Tilantongo in
Mixteca, Oaxaca, Mexico- re-planting
750,000 trees/year**

Yucuyoco, Mixteca, Oaxaca

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Image credit: Dr. Anabel Ford

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**Milpa in winter wheat
covercrop**

“Cajete” maize as biocultural keystone



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• **Center for Integral Campesino Development of the Mixteca (CEDICAM)**

**Themes and Principles of Climate Resilient Agro-
forestry**

1) Working with ecological succession-mosaic ecologies are most diverse, productive and flexible

- 2) Biocultural adaptation- “cultural keystone species”

- 3) Design at watershed scale for flexibility and responsiveness rather than top-down mega-schemes

- 4) Soil creation and stabilization- carbon in soil both mitigates climate change and creates resilience to effects of climate change

- 5) Maximum diversity [at all scales, in all dimensions] = resilience

- 6) Make good use of existing quantitative data on carbon

sequestration and productive
potential of systems

- 7) Choose regionally tailored systems and species, and also test outliers for future use

Mutual aid and cooperation as ancient agricultural and survival pattern- Read Kropotkin “Mutual Aid: A Factor in Evolution”

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- * African-American survival and organizing during Jim Crow
 - * Mutualistas and Arab-American immigrant groups
 - * Via Campesina
 - * The Grange
 - * Mondragon

- * Russian Villagers up through World War 1
- * Italian land co-operatives and resistance to Mussolini
- * Jewish resistance in Warsaw Ghetto

• Agro-forestry provides many functions at once

- **Foods and medicines from animals, plants and fungi**
- **Essential building and craft materials**
- **Charcoal and firewood**
- **Animal fodder and mineral rich mulch for annuals**
- **Habitat restoration for pest predators**
- **Carbon sequestration**
- **Recreation/agri-tourism**
- **Green burial**

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- 1) Intensive coppice and pollard production
- 2) Silvopasture with subsoiling for establishment and intensive rotational grazing
 - 3) Successional mosaic farming with n-fixing overstory
 - 4) Living fences and living trellises
 - 5) Biochar production at mid-scale
 - 6) Veld guilds/hedgerows with layered production guilding
 - 7) Steep slope nut tree reforestation with nurse trees
 - 8) Riparian cropping guilds
 - 9) Myco-forestry
 - 10) Bamboo polycultures
- Important agro-forestry techniques for our region

Intensive coppice and pollarding

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- * 1-15 year coppice cycle depending on use
 - * Prioritize along edges in the “veld”
 - * Willow, black locust, tulip poplar, sweet gum, mulberry, poplar, alder

. Coppice with standards

Coppice Edge (Veld) Guilds

1) Establish using rotated poultry/cover-cropping cycle for 1-2 years to

clear space and reduce weed seed load; grow strawberries, red clover,

egyptian walking onions for first 3-5 years until coppice is established.

2) Select species that you can propagate or obtain affordably; invest in

high quality gene pools for the long haul.

3) Plant at 6-10' spacing depending on species and primary uses

4) Harvest on 1-15 year cycle depending on species and primary uses.

. Best coppice species in our region

- . Black locust**
- . Mulberry**
- . Willow**
- . Basswood**
- . Tulip poplar**
- . Hazelnut**
- . Chestnut**
- . Sassafras**

- Alder
- Autumn olive? (contraversial)
- Paulownia? (contraversial)

• **Charcoal kiln**

- **Where Renewable Energy, Sustainable Forestry and Organic Agriculture Come Together- A Pyrolytic Multiple Yield Electrical Plant**

Silvopasture with subsoiling for establishment and intensive rotational grazing

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- * Most carbon sequestered of any land use style

- * Highly adaptable

- * Alder, black locust, mulberry, honey locust, fodder willow, poplar, mimosa

Honey locust, alder, pecan, mini-cow silva-pasture

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1) In this region, we want 20-30% shade action on pasture in mid-summer to optimize pasture productivity and animal health.

- 2) Maintain trees with pollard/low pruning styles for fodder harvesting
- 3) Use rotational fencing or permanent paddocks to distribute manure/impact.

Successional mosaic farming with n-fixing overstory

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- * possible a nitrogen self-sufficient system
 - * integrates annual crops, silvopasture, herbaceous perennials, wood/char production in 5-15 year rotational cycle
 - * Alder species, mimosa, false indigo

Milpa/alno-culture cycle

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1) Integrates annual agriculture, pasturing, fodder and fuel/craft wood production, nitrogen fixation, biochar production

- 2) Read Dave Jacke article on “Ligurian Alnoculture” in Permaculture Activist magazine, 2012
- 3) Space alders (hazel alder is main native SE species, but also try black

alder, red alder) at 8-10' triangular pattern, coppice/pollard pasture on 8-12 year cycle

“Veld” guilds/hedgerows with layered production guilding

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- **2) Select species that you can propagate or obtain affordably; invest in high quality gene pools for the long haul.**
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Living fence Guilds

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* Different styles: living fencepost,
woven, laid

- * Mulberry, black locust, alder,
willow, prickly pear, osage orange

Pollard Fence Post Guild

- 1) Ex: Mulberry/black locust alternated at 8-10' spacing
- 2) Stinging nettles, red clover, mint species in understory,
- American Groundnut/schisandra/muscadine grape as
- possible vine layers
- 3) Maintain black locust pollard stubs smaller than mulberry
- for increased mulberry light access
- 4) Run metal or homegrown wooden fencing materials
- Horizontally between living tree fence posts
- 5) In early/mid-June, scythe understory down and lay tarps for
- mulberry harvest

- **Streamside Reforestation Cropping-**
- **Elderberry, Sochan, Mulberry, Alder,**
- **Stropharia mushrooms, trout**



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Important Species

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1) White, red and black mulberry

- 2) Black locust
- 3) Honey locust
- 4) Alder spp.
- 5) Fodder willow
- 6) Populus spp.
- 7) Selected oak genetics
- 8) Selected swarm bred chestnut genetics
- 9) Elderberry
- 10) Stropharia, oyster, reishi mushrooms



Mulberry

. Morus alba, rubra and nigra

- **Appalachian Reishi**
. Ganoderma tsugae

- **Elderberry**
 - *Sambucus nigra/canadensis*

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Sochan-Rubeckia laciniata (cousin to black eye susan)

- **Oyster Mushrooms**
● *Pleurotus spp.*

- **Chestnut- steep slope
reforestation**
Castanea spp.

Economic and Collaborative Strategies

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1) Learn from Via Campesina and indigenous farming movements- and discern what doesn't transfer

- 2) Coop financing- savings pools (Cooperate WNC)
- 3) Land access- combine housing and agroforestry projects
- 4) Plant breeding and sharing, bare-root bulk purchasing
- 5) Equipment sharing, work bursts
- 6) Coordinated research grants

- 7) Mentorship, knowledge-sharing, specialization networks
- 8) Shared processing, marketing and promotions facilities
- 9) WNC Collaborative Ag Network

. A Permaculture Site Plan

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Coppice

**. Coppice recently harvested,
leaving standards**

**. Coppiced hazel under
standard oak**

Mulberry Pollards in Winter

- **Guilds and polycultures**
- Remember that designed guilds come from observing and imitating “natural” assemblages of creatures
- Any complete guild needs to involve:
 - Nitrogen fixers (kudzu, clovers, vetches, black locust, *Eleagnus* spp.)
 - Dynamic accumulators (burdock, comfrey, basswood)
 - Insectory plants- pollen for pollinators, habitat for predators
 - Fungi
 - Animals

Pollard living fence guilds

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A Few Sources

- 1) **Edible Forest Gardens,, both volumes, Dave Jacke and Eric Toensmier**
- 2) **Tending the Wild, by M. Kat Anderson**
- 3) **Agroforestry News, Martin Crawford, UK**
- 4) **The Woodland Way and other “Woodland” books by Ben Law**
- 5) **1491 by Charles C. Mann**

- **6) Growing and Marketing Ginseng, Goldenseal and other Woodland Medicinals by Jeanine Davis and W. Scott Persons**
- **7) “Agroforestry Notes”, USDA**
- **8) J.R. Russel Smith- “Tree Crops: A Permanent Agriculture”**

- **9) Bill Mollison- “Introduction to Permaculture”**