


# Agroforestry Enterprise Planning


## Agroforestry and Perennial Crops

- Meeting human needs while improving ecosystem health
  - Food and other yields
  - Carbon sequestration
  - Soil building



## Polycultures

- 2 or more species
- Minimal competition
- Maximum cooperation
- Optimize management and harvest
- Livestock integration




## Focus

- US
- Direct market
- Specialty products




## Challenges: Time Lag

- Waiting for perennial crops to bear
- Waiting for system establishment
- Waiting for positive cash flow



## Challenges: Extra Costs

- Establishing livestock management systems for mowing etc.
- Establishing support crops
  - Nitrogen fixers
  - Windbreaks
  - Living fences
  - Shade trees
  - Living trellis trees
  - Shade legume groundcovers
  - Etc.



### Challenges: Experimentation

- Unfamiliar new crops
- Unfamiliar new production systems



### Challenges: Marketing

- New and unusual products
- No customer familiarity
- Lack of established marketing channels







### FARM PLANNING PROCESS

- Goal setting
- Balance drivers
  - Land location and capability
  - Market research
  - Enterprise selection
  - Financial capability
- Budgeting
- Whole farm plan – site, economics, QOL



### CASE STUDIES

### Sample Commercial Systems

Macadamia nut ( <i>Macadamia integrifolia</i> )	Coffee (Coffea species)	Macadamia nut trees with coffee understorey		Hawaii
Sesban (Sesbania sesban)	Passion fruit ( <i>Passiflora</i> species)	A nitrogen fixing tree (for firewood, mulch, or animal fodder) supporting and shading passion fruit vines		Africa
Coconut ( <i>Cocos nucifera</i> )	Pasture	Coconut with pasture and livestock underneath		Polynesia (Dalla Rosa 1993)
Peach palm ( <i>Bactris gasipaes</i> )	Black pepper vine ( <i>Piper nigrum</i> ) and cocoa ( <i>Theobroma cacao</i> )	Peach palm over cocoa and supporting black pepper vines		Brazil (Nair 1993)

Source: Elevich, Agroforestry Guides for Pacific Islands

### Walnut Meadows – West Virginia

- 300 acres of managed forest land
- 10 acre walnut timber plantation
- On-site sawmill, drying kiln, cabinet shop
- 50 year plan laid out



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### Walnut Meadows - Ginseng

- 30+ acres
- Grown in forest after thinning
- Grows to 8-13 years old
- Ex: 1,000 lbs from 3000 sq ft @\$50/lb
- Also national seller of ginseng seed
- High disease pressure in wet years



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### Walnut Meadows - Mushrooms

- Inoculate branches from felled timber
- Multiple species produced
- Grow in shade of timber trees



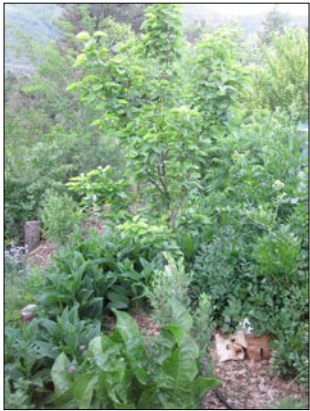
### Jerome's Organics Basalt Colorado



Products: produce, nursery stock, consulting Markets: restaurants, health food stores, courses

### An Edible Ecosystem

- Mostly perennial
- Low maintenance
- Soil building
- Weed suppressing
- Pest controlling
- Habitat providing
- Carbon-friendly
- Food producing



### Roberto Muj – Chimaltenango, Guatemala Perennial Market Garden



Products: cut flowers, medicinal herbs, fruits & nuts, more Markets: farmers' markets, stores, family use

### ENTERPRISE SELECTION

### Enterprise Selection Guidelines

- What can you PRODUCE
  - Main crops: suited to your site, low-maintenance
  - Support species with marketable products
  - Integrated livestock to assist management
- What can you SELL
- What products FIT your marketing plan
  - Complementary products



### Direct Market vs. Wholesale

- Direct Marketing
  - keep higher %
  - work more
  - limited quantities
  - Set your own price
  - Can sell new & unusual products
- Wholesaling
  - lower profit per unit
  - Less work → can focus more on production
  - Can accept large quantities
  - Prices set by external businesses



### Value-Added Products

- Increase price and profitability
- Improve shelf life
- Diversify product line
- Some legal/processing issues



### The Smoothie Stand



### Artist's Charcoal



\$12.38/box

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### Native Wasabi



\$110/lb real wasabi

### Woody Cut Flowers



\$1000/yr single coppice stump in D.C.

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### Roast Pork



12 x 100lb pigs @ \$10/lb meat = \$6000 in one day

### Biochar



5 gallon bucket \$36.50

### Native Useful Plant Seed



*Ceanothus americanus (New Jersey Tea)*

Seeds		Bare Root Plants		Potted Plants	
Quantity:	Pricing:	Quantity:	Pricing:	Quantity:	Pricing:
Packet	\$2.00	1 - 2	\$7.00	Tray of 36	\$98.00
3/8 oz.	\$10.00	3 - 11	\$6.00		
1/4 oz.	\$15.00	12 - 35	\$4.20		
1/2 oz.	\$25.00	36 - 99	\$3.60		
1 oz.	\$40.00				
1 lb.	\$900.00				

A deciduous shrub that grows just 3' tall, the dried leaves of New Jersey Tea make a flavorful tea that was popular during the Revolutionary War.

Source: Prairie Moon Nursery Catalog

### Power Line Contracts



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### AGROFORESTRY BUDGETING



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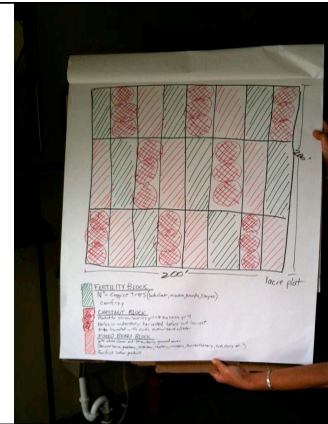
### Step One: Create Working Polycultures

- Minimize competition
- Maximize cooperation
- Optimize harvest and management logistics
- Integrate livestock to reduce labor and inputs
- Establish, observe, refine



### CASE STUDY

- Young plant geek rural area low-cost land
- One acre
- Shared deer fence and swales
- CHESTNUT BLOCK
  - Chestnut for flour
  - Strawberries Y 1-3
  - Nectary tea herb understory
- MIXED BERRY BLOCKS
  - Berries for fruit leather
  - Strawberries Y 1-3
  - White clover
- FERTILITY BLOCKS
  - Chop & drop
  - Mimosa & Amorpha
  - Comfrey



### Step Two: Project Yields and Shade Impacts

- For 10-100 year planning window
- Generally overstory yields go up with time
- Pasture yields generally go down
- Sunny understory and alley crop yields go down
- Shade crops can be established and then yields begin
- This can cause polyculture to be redesigned

### Shade and Yield Impacts

SHADE	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
chestnut	Sun	Sun	Sun	Part	Part	Part	Part	Shade	Shade	Shade

YIELD (lbs/acre)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
chestnut	0	0	0	0	160	330	500	600	700	700
strawberry	0	2600	2000	0	0	0	0	0	0	0
tea herbs	0	0	0	200	500	500	500	500	500	500

### Step Three: Marketing and Processing

- Aim for shared marketing channels to minimize labor and expenses
- Aim for shared processing equipment for same reason
- This can also cause polycultures to be refined

### Shared Resources

- Shelf-stable products for shipping
- Shared direct market website
- Shared drier processing equipment
- Need for grain grinder

### Step Four: Run the Numbers

- Collect and review enterprise budgets
- Multi-year cash flow: revenues and expenses
- Project savings from livestock integration and support plants
- Fill gaps in cash flow
- This can also refine polycultures

ITEM	YEAR					Through Life of Vineyard	YOUR BUDGET
	0	1	2	3	4-20		
<b>INCOME</b>							
Grapes	0	0	0	0	3	5	
Price	\$0	\$0	\$0	\$2,375	\$4,750	\$53,125	
<b>VARIABLE COSTS</b>							
Cover Crop Seed	15					15	
Vines	2,316					2,316	
Fertilizer	20	50	50	50	50	1,520	
Lime	45	0	0	0	0	45	
Pesticides	30	196	294	411	411	7,918	
Hand Labor	0	1,710	513	702	567	12,564	
Harvesting Costs	0	0	0	1,550	500	9,550	
Machinery Operating Expense	38	432	167	179	193	4,959	
Custom Machine Hire	75	75	75	75	75	1,575	
Miscellaneous	10	215	49	111	81	1,761	
Interest on Oper. Cap.							
<b>TOTAL VARIABLE COSTS</b>	233	4,994	1,148	2,578	1,877	40,860	
<b>FIXED COSTS</b>							
Operator Labor Charge	50	50	50	50	50	1,000	
Mach. And Equip. Charge	6,000					6,000	
Land Charge	100	100	100	100	100	2,100	
Taxes	2,624					2,624	
Liability Insurance	50	50	50	50	50	1,000	
Management Charge	100	100	100	100	238	4,438	
<b>TOTAL FIXED COSTS</b>	250	7,344	300	300	438	16,232	
<b>TOTAL COSTS</b>	483	12,338	1,448	2,878	2,314	57,091	
<b>RETURN OVER VAR. COSTS</b>	(233)	(4,994)	(1,148)	(2,578)	(2,373)	(42,265)	
<b>RETURN OVER TOTAL COSTS</b>	(483)	(12,338)	(1,448)	(528)	(522)	(26,834)	
<b>PERCENT VALUE RETURN<sup>3</sup></b>	(483)	(11,762)	(1,192)	(276)	(1,664)	(85)	

ENTERPRISE	YEAR ONE	YEAR TWO	YEAR THREE	YEAR FOUR	YEAR FIVE	YEAR SIX	YEAR SEVEN	YEAR EIGHT	YEAR NINE	YEAR TEN
<b>CHOP</b>										
Deer fence	\$1,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Swales	\$450									
Amendments	\$500									
Grain Grinder					\$500					
Packaging	\$500	\$500	\$500	\$700	\$700	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Marketing	\$1,500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500
Dryer (6-house)	\$1,300									
<b>Total</b>	\$5,250	\$1,000	\$1,000	\$1,200	\$1,700	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500
<b>Chestnut</b>										
Yields	0	0	0	0	160	330	500	600	700	700
Price/lb	\$15	\$15	\$15	\$15	\$15	\$15	\$15	\$15	\$15	\$15
Income	\$0	\$0	\$0	\$0	\$2,400	\$4,950	\$7,500	\$9,000	\$10,500	\$10,500
Costs	\$200	\$0	\$50	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Shrub Berries</b>										
Yields	0	0	1300	2000	3300	3300	3300	3300	3300	3300
Price/lb	\$5	\$5	\$5	\$5	\$5	\$5	\$5	\$5	\$5	\$5
Income	\$0	\$0	\$6,500	\$11,000	\$16,500	\$16,500	\$16,500	\$16,500	\$16,500	\$16,500
Costs	\$330	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Coppice Legume</b>										
Costs	\$150	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Cumfrey</b>										
Costs	\$300	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Herbs</b>										
Yields (dry)	0	0	0	200	500	500	500	500	500	500
Price/lb	\$10	\$10	\$10	\$10	\$10	\$10	\$10	\$10	\$10	\$10
Income	\$0	\$0	\$0	\$2,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Costs	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Strawberry</b>										
Yields	0	2600	2000	0	0	0	0	0	0	0
Price/lb	\$5	\$5	\$5	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Income	\$0	\$13,000	\$10,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Costs	\$3,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>TOTAL INCOME</b>	\$0	\$13,000	\$16,500	\$13,000	\$23,900	\$26,450	\$29,000	\$30,500	\$32,000	\$32,000
<b>TOTAL COSTS</b>	\$9,180	\$1,000	\$1,050	\$1,200	\$1,700	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500
<b>PROFIT</b>	-\$9,180	\$12,000	\$15,450	\$11,800	\$22,200	\$24,950	\$27,500	\$29,000	\$30,500	\$30,500

### Financing

- CSA model
- Crowdfunding
- Peer to Peer Lending
  - Prosper.com, lendingclub.com
- Community and Microfinance Lenders
- Traditional Business and Ag Lenders
- Investors Circle, Slow Money
- Program-Related Investment



### Challenge!

- In absence of policy changes
  - Requires innovation at every level
  - Some very good opportunities
  - Many new operations in last 3-5 years

