

Business Planning and Economics of Midwestern Grape Production

**Bruce Bordelon
Department of Horticulture
Purdue University**

The U.S. Wine Industry

- **\$16.8 billion per year**
- **3rd behind Italy and France**
- **1600 wineries in the US**
 - Half in California
 - Half in the rest of the country

Wine Production in the Midwest

- **Tremendous growth in the past 10 years**
 - Number of wineries
 - Grape production
- **Over 225 wineries in the Midwest**
(14 states: AR, IL, IN, IA, KN, KY, MI, MN, MO, NE, OH, OK, TN, WI)
- **Opportunity!**
 - Alternative crop
 - Value-added product

Business Planning and Economics

3 Points to Consider

- **High establishment and production costs**
- **Market?- Grape demand and prices**
- **Long-term investment (25 years)**

Develop a business plan before starting into grape production

Establishment Costs

Fixed Costs - Do not vary with acreage
– Overhead on land, machinery, buildings, etc.

Variable Costs -Vary with acreage

- **Materials** (posts, wire, vines, etc.)
- **Labor**
 - 20 to 40 % of total establishment costs
- **Equipment operating expenses**

Budget Assumptions

- Overhead for land and equipment not included (\$120/acre/year land charge)
- Good to excellent site
- Well adapted cultivar
- 7' x 9' vine/row spacing, 691 vines/acre
- 448 ft rows, end posts with anchors
- 2-wire trellis - Bilateral cordon training
- Grass row middle / herbicide strip
- Labor costs \$8.00/hr
- Accumulated costs financed at 8% per year

Estimated Vineyard Establishment Budget

Paul Domoto, Iowa State University, 2001

Establishment Costs per Acre - Year 1

<u>Operation</u>	<u>Cost/Acre</u>
Site Preparation	170
Vineyard Layout and Planting.....	1348
Trellis Establishment	
– Material	1482
– Installation	520
Cultural management	1022
Land Charge	120
Interest on operating expenses	187
Total Cash Expense Year 1	4847

Establishment Costs per Acre - Year 2

<u>Operation</u>	<u>Cost/Acre</u>
Dormant Pruning.....	71
Replanting	34
Weed Control (materials & labor)	93
Disease & Insect Control (materials & labor)	246
Fertilization.....	20
Vine Training	272
Land charge	120
Interest on operating expenses (856 @ 4%).....	34
Interest on accrued expenses year 1 (\$4847 @ 8%)	388
Cash Expense Year 2	1278
 Total Accumulated Cash Expense	
for Years 1-2	6124

Establishment Costs per Acre - Year 3

<u>Operation</u>	<u>Cost/Acre</u>
Dormant Pruning and training.....	330
Weed Control (materials & labor)	93
Disease & Insect Control (materials & labor)	374
Fertilization.....	32
Canopy Management	368
Land charge	120
Harvest Costs (grape lugs + labor)	759
Interest on operating expenses	83
Interest on accrued expenses year 2 (\$6124 @ 8%)	490
Cash Expense Year 3	2656
Income on 1.5 tons @ \$1,000 per ton	(1500)
Total Accumulated Cash Expense	
for Years 1 - 3	7280

Establishment Costs per Acre - Year 4

<u>Operation</u>	<u>Cost/Acre</u>
Dormant Pruning and training.....	250
Weed Control (materials & labor)	104
Disease & Insect Control (materials & labor)	414
Fertilization.....	35
Canopy Management	368
Land charge	120
Harvest Costs (grape lugs + labor)	738
Interest on operating expenses	81
Interest on accrued expenses year 3 (\$7280 @ 8%)	582
Cash Expense Year 4	2694
Income on 3.0 tons @ \$1,000 per ton	(3000)
Total Accumulated Cash Expense for Years 1 - 4	6974

Production Costs per Acre - Year 5 and on

<u>Operation</u>	<u>Cost/Acre</u>
Dormant Pruning	214
Weed Control (materials & labor)	104
Disease & Insect Control (materials & labor)	414
Fertilization.....	32
Canopy Management	368
Land charge	120
Harvest Costs (labor)	362
Interest on operating expenses	65
Cash Expense Yearly	1684
Income on 3.5 tons @ \$1,000 per ton	(3500)
Interest on accrued expenses @ 8%)	decreases
Total Accumulated Cash Expenses decreases	

Establishment Budget Comparisons

- **Indiana**
 - \$7883 / acre over 3 years w/o land costs
 - \$9,132 / acre including land & equipment
- **Traverse City, Michigan**
 - \$8397 / acre over 3 years w/o land costs
- **NY Finger Lakes**
 - \$7742 / acre over 3 years without land costs
 - \$10674 / acre with land & equipment
- **Washington State**
 - \$7,000 / acre over 3 years without land costs
- **Oregon**
 - \$9589 / acre over 3 years with land & equipment
- **California (Lodi district)**
 - \$5949 / acre over 3 years without land costs

Production Cost

During establishment cost recovery

\$2300 per acre per year

- **Includes interest on accrued expense**

After establishment cost recovery

\$1700 per acre per year

- **Labor (58%)**
- **Materials (fertilizer, pesticides) (23%)**
- **Equipment operation expenses (17%)**
- **Interest on operating expenses (2%)**

Profitability

Profit (\$/acre) =

Yield (tons/acre) x Price (\$/ton) - Production Costs

- **Determine cost of production (\$/ton)**
- **Determine break-even price or yield**
 - During establishment cost recovery
 - After establishment cost recovery

Profitability

Problem: High establishment costs and 3-4 year wait

- Gross returns are not large enough to overcome production costs and quickly recover establishment costs (and interest)

Possible Solutions:

- Reduce establishment costs
- Get into production quickly
- Increase yields
- Increase price of grapes

Effects of Price and Yield on Rate of Return

- **5 tons/acre @ \$500/ton**
 - 23 years to recover establishment costs
- **5 tons/acre @ \$600/ton**
 - 12 years
- **5 tons/acre @ \$700/ton**
 - 9 years

- **6 tons/acre @ \$500/ton**
 - 13 years
- **7 tons/acre @ \$500/ton**
 - 10 years
- **8 tons/acre @ \$500/ton**
 - 8 years

Options to Decrease Establishment and Production Costs

- **Maximize use of mechanization**
 - reduce labor costs
- **Manage labor efficiently**
- **Maximize cultural management - early production**
 - weed control
 - training
- **Equipment alternatives**
 - rent, borrow, lease, custom
- **Trellis alternatives**
 - posts: steel, wood, sizes, number, end assemblies, anchors
 - Beware false economy!
- **Vine alternatives**
 - grafted, own-rooted, grow your own, spacing

Marketing

Marketing has a direct impact on profitability

Get the highest price for grapes

- **Grow high quality fruit**
- **Written contract - negotiated price**
- **Profit share with winery**
- **Partnership with winery**

Pricing Grapes

- **Break-even price plus ?%**
 - ?% Return on Investment (~15%)
 - Contract with winery
 - Sell by the acre (rather than by the ton)
- **Bottle price multiplier**
 - (Retail price/ bottle X 100) = \$/ton
- **Sugar Standards**
 - price based on sugar content (+ or - base price)

Value of Grapes in Wine

	Price per ton			
	<u>\$500/ton</u>	<u>\$600/ton</u>	<u>\$700/ton</u>	<u>\$800/ton</u>
\$/bottle	0.67 ^a	0.80	0.93	1.07
\$/gallon	3.33	4.00	4.66	5.33
\$/case	7.99	9.60	11.18	12.79

\$0.13/bottle for each \$100/ton

At \$500/ton (\$8/case) grapes = 18% of total cost ^b

At \$1,000/ton (\$16/case) grapes = 31% of total cost ^b

^a **Based on 150 gallons of finished wine per ton**

^b **Based on \$35/case to produce**

Factors that Affect Grape Prices

- **Quality!**
 - Variety
 - Flavor, sugar, total acid, pH
 - Freedom from rots, defects
- **Supply and Demand**
- **AVA (Appellation of Origin)**
- **Restriction on importation**
 - higher value for in-state grown grapes

Summary

- **Vineyard establishment costs ~\$7,000-8,000 per acre over 3 years**
- **Overhead costs (land and equipment) vary depending on situation**
- **Major expenses: materials and labor during establishment; labor during production**
- **Rate of return depends on price & yield**
- **Quality is key to high price**
- **Develop a business plan**
- **Partnership with winery**