

**Using *AgBiz Logic* to Make
Investment Decisions:
*An AgBiz Logic Case Study***



Clark Seavert

Professor, Department of Applied Economics

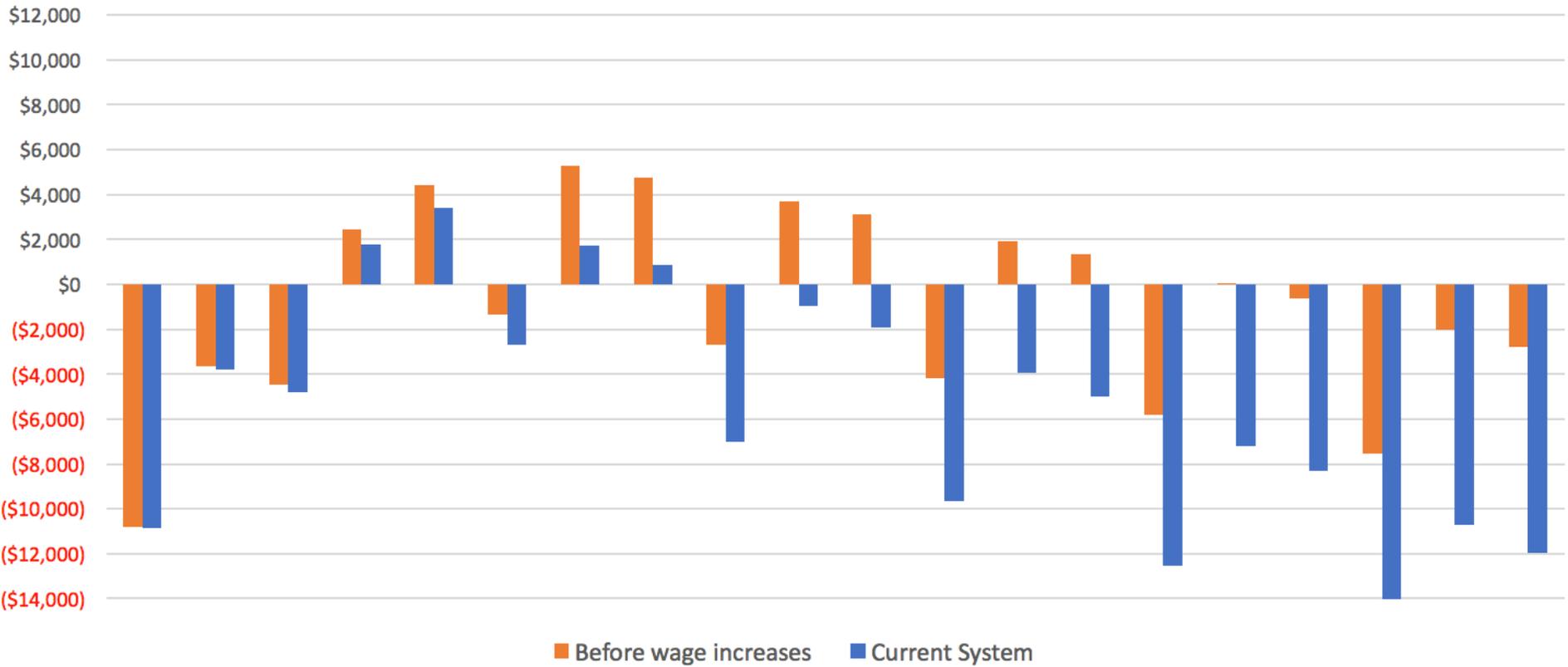
Executive Director, NW Agribusiness Executive Seminar

Oregon State University

Key Trends - *Industry and Others*

- **\$13.50 per hour minimum wage rates are a reality by 2020**

Net Returns to Sweet Cherry Orchards (\$1.22/Lb) w/ Assumed Yields before Minimum Wage Increases



Net Present Value of Before and After Minimum Wage Rate Increases
Discount rate of 6%

Before
(\$19,967)

After
(\$60,644)

Key Trends - *Industry and Others*

- **Immigration Reform**
- **Fully automated harvesters?**
 - *Cost of a machine*
 - *Number of machines required*
 - *Purchase vs. custom hire*

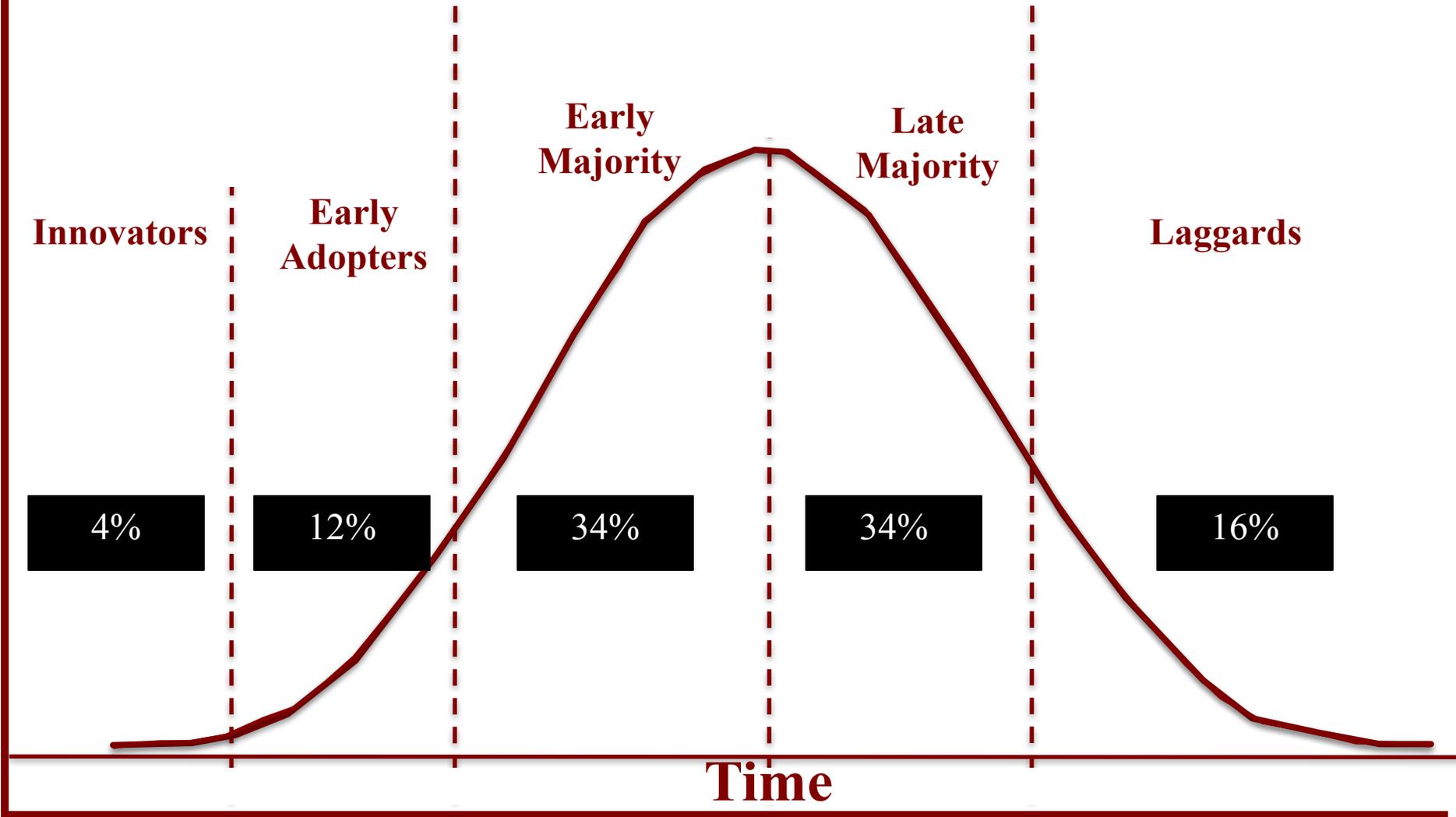
Key Trends - *Industry and Others*

- **Climate Change/Weather Variability:**
 - ✓ irrigation water shortages
 - ✓ condensed harvest season
 - ✓ Reduced chilling hours

- **Orchard Renewal:**
 - ✓ acres planted
 - ✓ increased per acre yields
 - ✓ increased per acre revenues
 - ✓ new varieties
 - ✓ costs to establish

Innovation Adoption Curve

Diffusion of Innovations: Everett Rogers



Orchard Renewal Decisions should be based on Capital Investment Analysis

Capital investment analysis is a budgeting procedure to assess the potential profitability of a long-term investment. The goal is to pinpoint the the most likely profitable option, at a minimum, based on a discounted cash flow analysis – net present value and internal rate of return.

Orchard Renewal Decisions should be based on Capital Investment Analysis

Block-by-block accounting is essential!

85 percent of agricultural producers do not have adequate accounting data to complete an accurate, meaningful capital investment analysis!

Profitability

Can I Make Money Doing This?

- 1. Net Present Value**
- 2. Internal Rate of Return**



Feasibility

Can I Afford To Do This?

- 1. Cash Flow Analysis**
 - Year to cash flow
 - Payback period
 - Costs to implement



***THREE Key Factors to
Successful Orchard Renewal***

- 1. Price**
- 2. Yield (When & How Much)**
- 3. Costs – Production & Establishment**

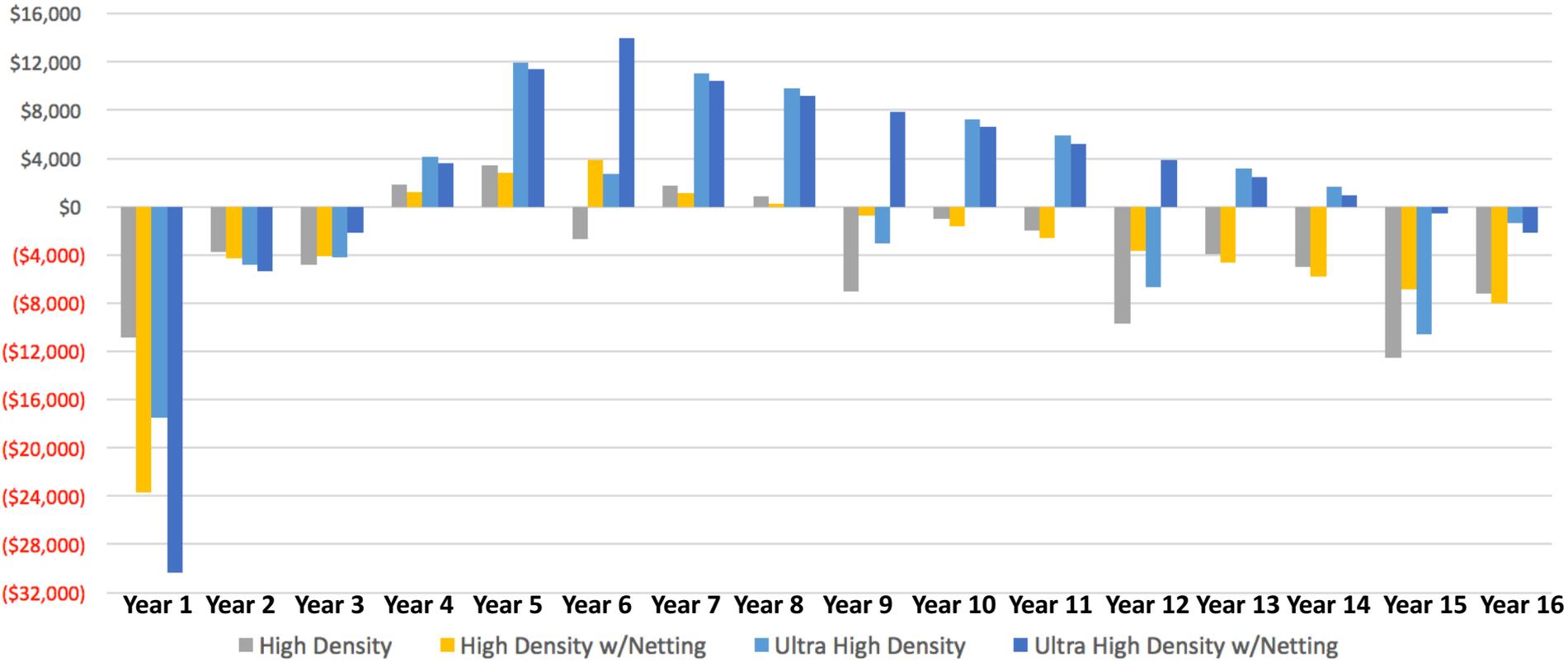
Labor Rates Assumed in *AgBiz Logic* Scenario

	2016	2017	2018	2019	2020
Minimum Wage Rate	\$9.47	\$11.00	\$11.50	\$12.00	\$13.50
<i>% Increase</i>		16.16%	4.55%	4.35%	12.50%
Labor Rates per Hour	\$13.80	\$16.03	\$16.76	\$17.49	\$19.67
Harvest Labor Rates per Lb.	\$0.30	\$0.32	\$0.34	\$0.36	\$0.38

Sweet Cherry Yields Assumed in *AgBiz Logic* Scenario

	Year 1/2017	Year 2/2018	Year 3/2019	Year 4/2020	Year 5/2021	Year 6/2022
High Density (10' x 16')	0	0	3,000	11,000	15,000	18,000
High Density w/Netting	0	0	3,000	11,000	15,000	18,000
Ultra High Density (4' x 12')	0	0	5,000	10,200	20,400	24,000
Ultra High Density w/Netting	0	0	5,000	10,200	20,400	24,000

Net Returns to Establish Sweet Cherry Orchards (\$1.22/Lb) with Assumed Yields



Net Present Value of Each Training System, Based on 6% Discount Rate and \$12,000 Beginning and Ending Investment Values: Breakeven Price per Pound and Yield for a NPV to Equal \$0 and a ROI of 12%

Training System	Net Present Value, Before Adjustments	B-E Price for NPV to be equal to \$0	B-E Yield for NPV to be equal to \$0	B-E Price to achieve a 12% ROI	B-E Yield to achieve a 12% ROI
High Density	(60,644)	+25.5%/ \$1.53	+58%	30.25%/ \$1.59	+65%
High Density w/Netting	(61,413)	+23.4%/ \$1.51	+40%	+31%/ \$1.60	+50%
Ultra High Density	(16,514)	+4.2%/ \$1.27	+7%	+7.8%/ \$1.32	+18%
Ultra High Density w/Netting	(4,545)	+1%/ \$1.23	+2%	+6%/ \$1.29	+10%

Sweet Cherry Yields Assumed in *AgBiz Logic* Scenario

	Adjusted for Net Present Value to Equal \$0				
	Yr 1/2017	Yr 2/2018	Yr 3/2019	Yr 4/2020	Yr 5/2021
High Density	0	0	3,000	11,000	15,000
<i>Adjusted Yields</i>	0	0	4,740	17,380	23,700
High Density w/Netting	0	0	3,000	11,000	15,000
<i>Adjusted Yields</i>	0	0	4,200	15,400	21,000
Ultra High Density	0	0	5,000	10,200	20,400
<i>Adjusted Yields</i>	0	0	5,350	10,914	21,828
Ultra High Density w/Netting	0	0	5,000	10,200	20,400
<i>Adjusted Yields</i>	0	0	5,100	10,404	20,808

	Adjusted for 12% Return on Investment				
	Yr 1/2017	Yr 2/2018	Yr 3/2019	Yr 4/2020	Yr 5/2021
High Density	0	0	3,000	11,000	15,000
<i>Adjusted Yields</i>	0	0	4,950	18,150	24,750
High Density w/Netting	0	0	3,000	11,000	15,000
<i>Adjusted Yields</i>	0	0	4,500	16,500	22,500
Ultra High Density	0	0	5,000	10,200	20,400
<i>Adjusted Yields</i>	0	0	5,900	12,036	24,072
Ultra High Density w/Netting	0	0	5,000	10,200	20,400
<i>Adjusted Yields</i>	0	0	5,500	11,220	22,440

Develop a 5-Year Business Plan
*with Specific Goals and a Method to
Benchmark Your Progress*

**Assess Current Operation
AND
Execute!**

Developing a 5-Year Business Plan

Step 1: Assess your Current Operation

- 1. Orchard Blocks**
- 2. Labor Requirements, Throughout the Season**
- 3. Financial Position**

Developing a 5-Year Business Plan

1. Orchard Blocks

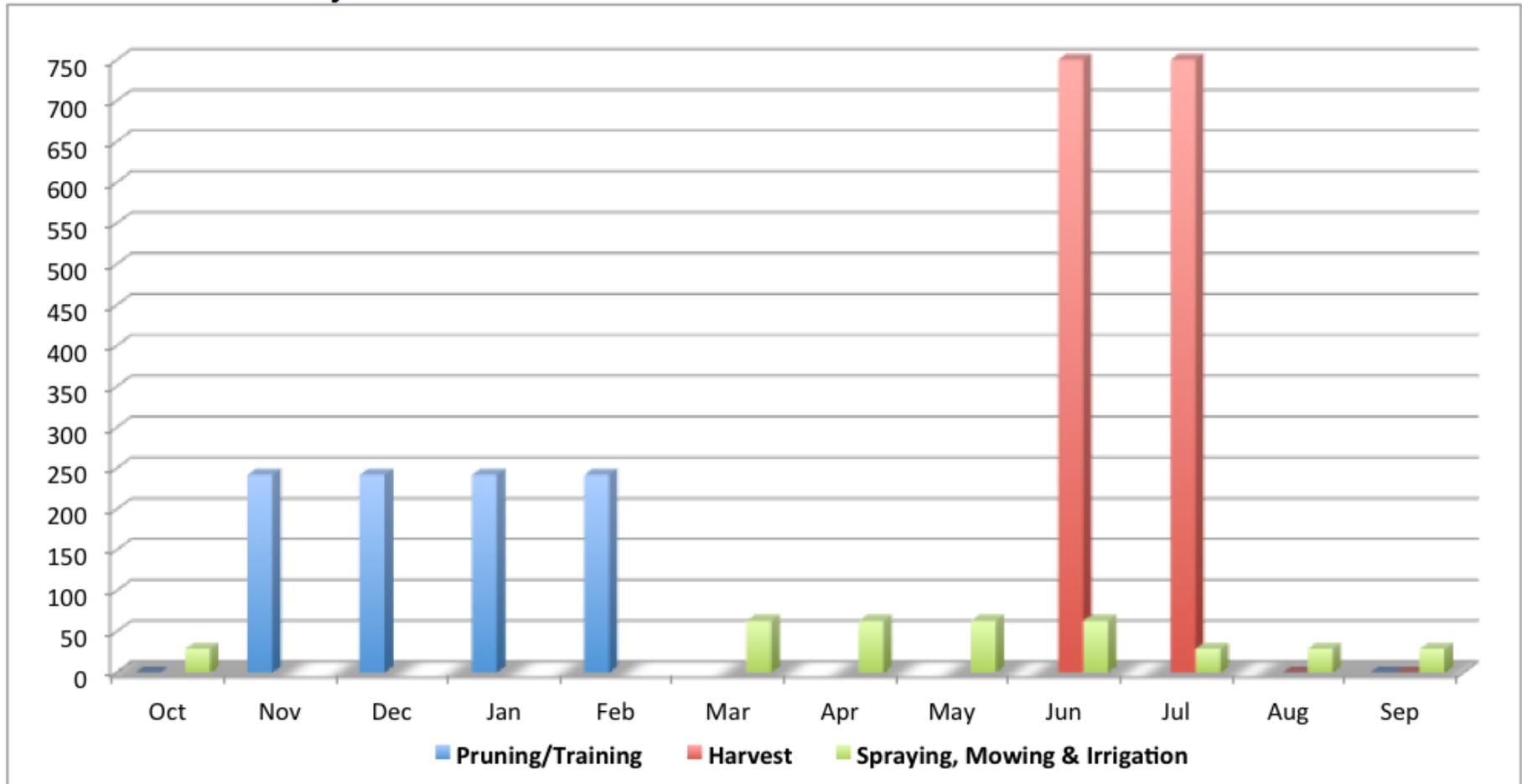
Based on your goals:

- *Which blocks are grossing \$25k per acre?*
- *Which blocks are contributing to increasing net farm income? At least 5% annually*
- *How does a block “fit” in your harvest season? How does it improve efficiencies and utilization of labor with new orchards and future technologies*
- *New blocks, is it designed to adequately acquire and retain labor? Is this the type of block that workers will make money?*

Developing a 5-Year Business Plan

2. Harvest Labor

Labor Requirements by Month to Prune, Train, Harvest & Perform Other Orchard Tasks, based on an 8-hour Person Day.



Developing a 5-Year Business Plan

Step 2: Execute, Execute, Execute

Options for Low Income Producing Blocks

1. Remove and replant

- Varieties with high grower returns*
- Harvest date to spread labor requirements*
- Training system for automated harvesting?*

2. Rejuvenate

- Water and nutrient management strategies*
- Assess your horticultural skills to increase yields and packouts*

Developing a 5-Year Business Plan

3. Financial Position

FIVE Key Financial Ratios and Performance Measures

1. Current Ratio

Current Assets \div Current Liabilities (Current Assets - Current Liabilities)

2. Working Capital to Total Farm Expenses

Working Capital / Total Farm Expenses

3. Debt-to-Asset Ratio

Total Liabilities / Total Assets

4. Profit Margin

Net Farm Earnings \div Total Farm Revenues

5. Value of Farm Production to Liabilities

Total Farm Revenues / Total Farm Liabilities

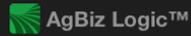
Developing a 5-Year Business Plan

Financial Position

Tree Fruit Producers with Gross Revenues of > \$2m

	<i>Current Ratio</i>	<i>Working Capital to Total Farm Expenses</i>	<i>Debt-to-Asset Ratio</i>	<i>Profit Margin</i>	<i>Value of Farm Production to Liabilities</i>
<i>Upper Quartile</i>	6.21	1.31	47.0	30%	1.61
<i>Median</i>	3.26	0.74	35.0	14%	0.95
<i>Lower Quartile</i>	1.88	0.42	19.0	4%	0.53

Information provided by *Northwest Farm Credit Services*, Craig Shindler, Branch Manager, Sunnyside, WA.



Data is always in Season

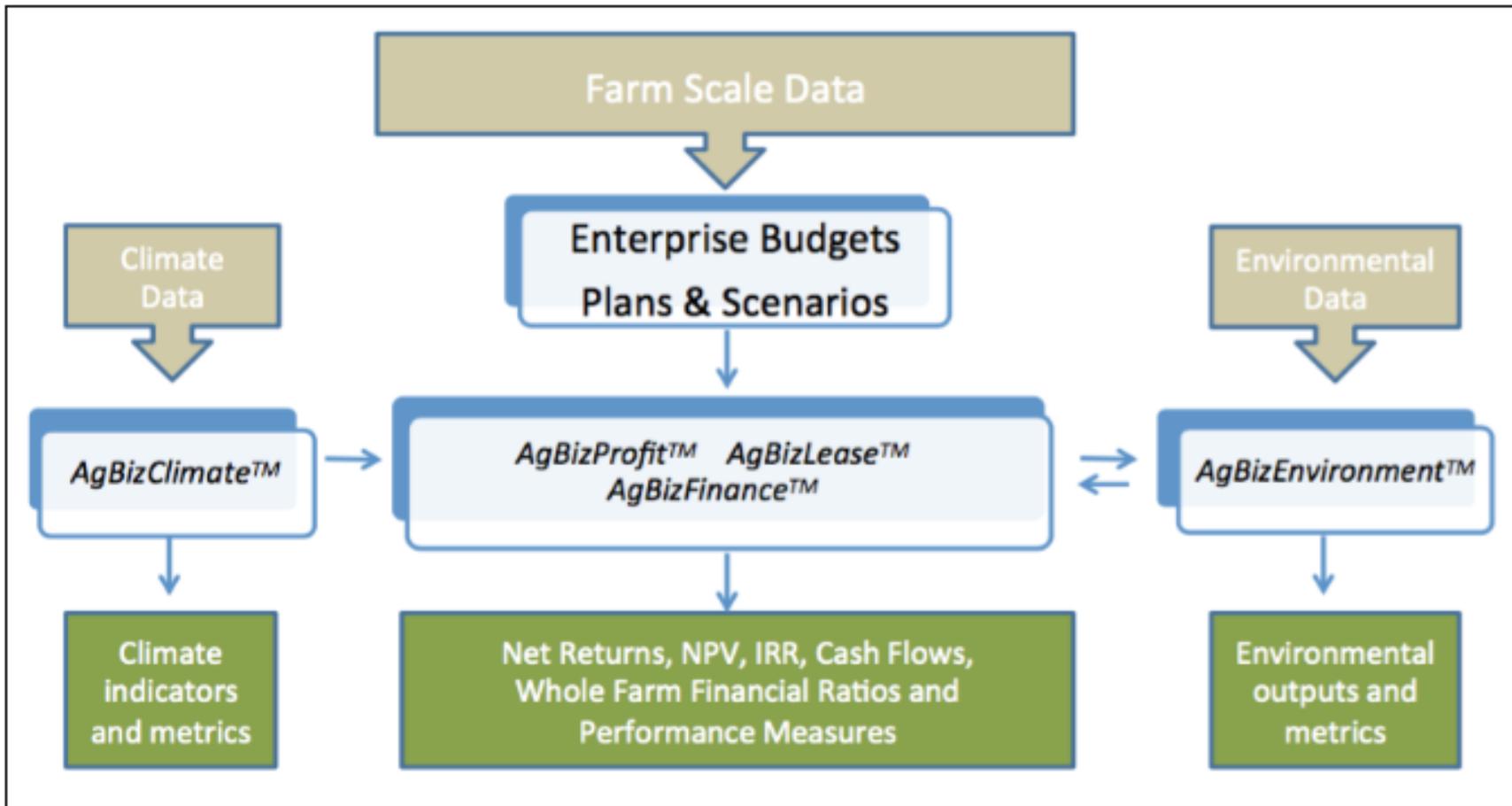
Thank you for visiting the *AgBiz Logic™* web site. This site is an economic, financial and environmental accounting decision tool to assist agribusinesses that grow, harvest, package, add-value, and sell agricultural products.

www.agbizlogic.com

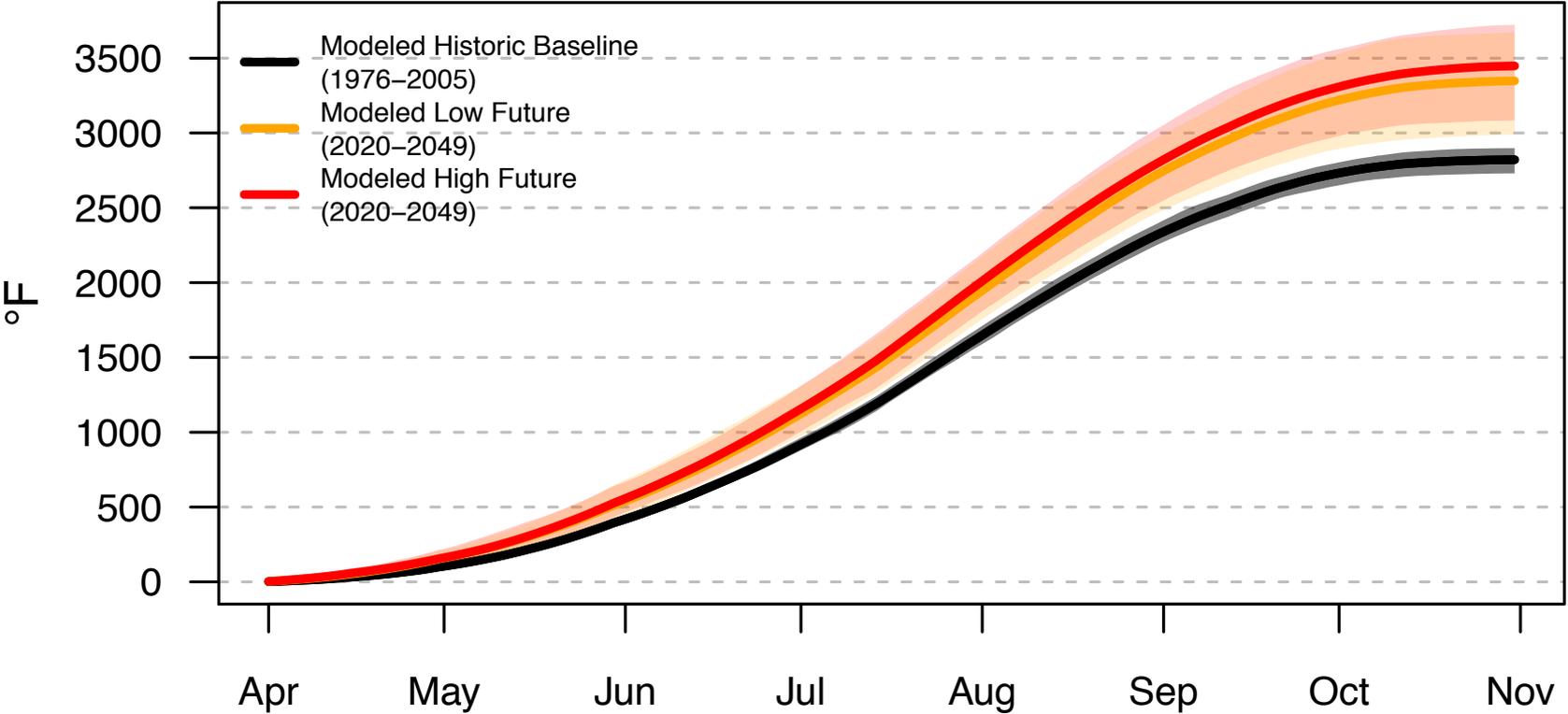
What is *AgBiz Logic*?

AgBiz Logic (ABL) is a suite of economic, financial, environmental and climate change decision-support tools that enable producers to increase or assess profitability while assessing environmental trade-offs.

AgBiz Logic Platform

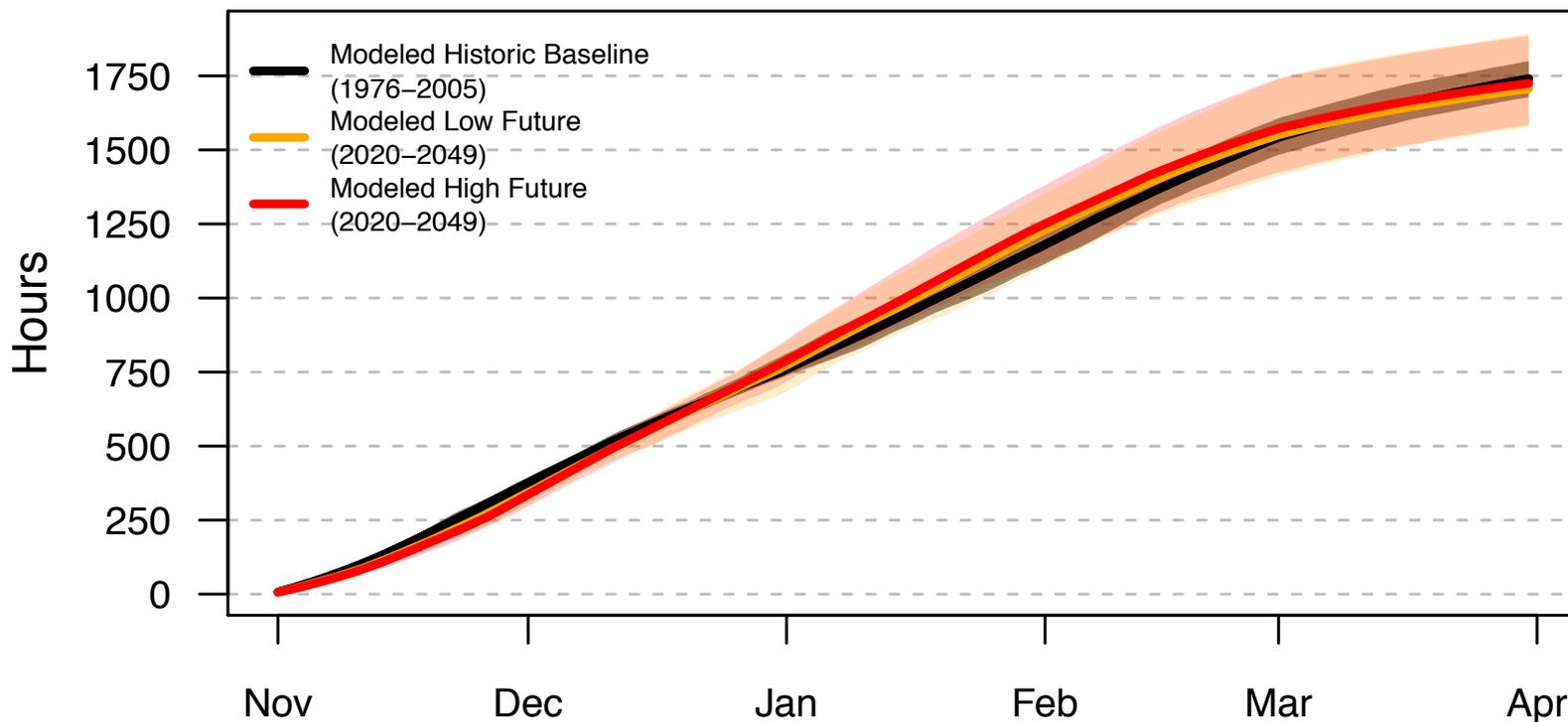


Accumulated Growing Degree Days (Base 50°F) Wenatchee



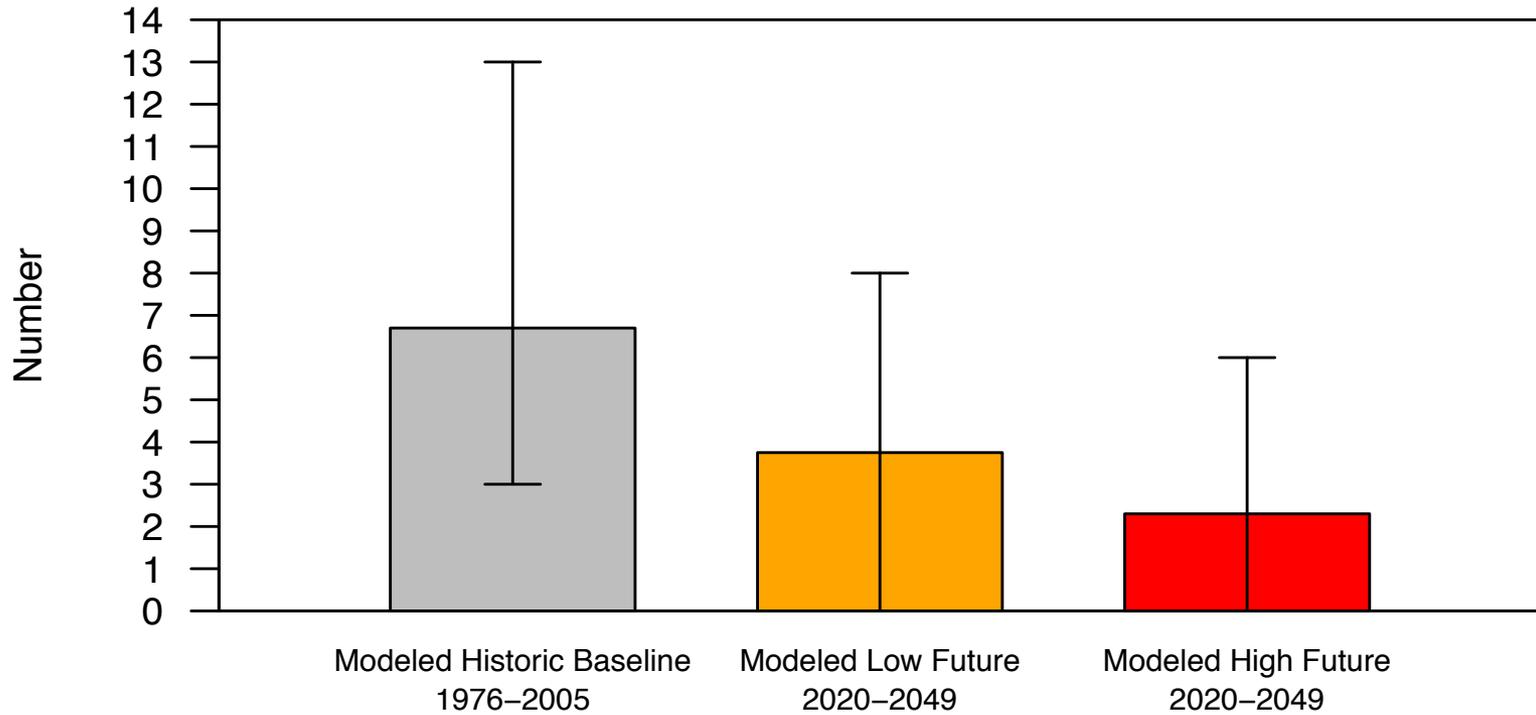
By the 2030s, accumulated growing degree days from April 1 to October 31 is expected to increase by 527 degree-hours for the low emissions future and by 627 degree-hours for the high emissions future compared with the historical baseline.

Accumulated Chill Hours (Between 32°F and 45°F) Wenatchee



By the 2030s, accumulated chilling hours from November 1 to March 31 is expected to decrease by 34 hours for the low emissions future and by 16 hours for the high emissions future compared with the historical baseline.

Number of Cold Snaps (3+ consecutive days below 0°F) per 30 Years Wenatchee



By the 2030s, the frequency of cold snaps (3+ consecutive days below 0°F) in a 30-year period is expected to decrease by 3 occurrences for the low emissions future and by 4 occurrences for the high emissions future compared with the historical baseline.

Farm-level Data is “King” in *AgBiz Logic*

- Cost and return (enterprise) budgets are the foundation of *ABL*
- Three methods of data collection within *ABL*:
 - ✓ Schedule F (Form 1040) Federal tax returns
 - ✓ Import data from accounting system via .csv/.exe files
 - ✓ University & industry enterprise budgets

Transfer your business data to AgBiz Logic

The first step toward utilizing AgBiz Logic decision tools is to populate AgBiz Logic with income and expense data generated from your business. Once this information is entered, you'll be able to allocate income and expenses to create enterprise budgets for personalized scenarios.

We provide three methods for collecting your business data. Select one from the list below, and proceed through the steps provided.

- Enter information from your Schedule F/Form 1040
- Import data from your accounting system or spreadsheet
- Select existing University Budget(s) (if you don't have your own data)

Business Allocation

Income

Category	Total	Crop [?]	Livestock [?]	Whole Farm [?]	\$ or % [?]
Sales of livestock, produce, grains and other products	\$3,800,000	\$ 3,000,000	\$ 800,000	\$0	%
Cooperative distributions received	\$3,000	\$ 0	\$ 0	\$3,000	%
Agricultural program payments	\$60,000	\$ 60,000	\$ 0	\$0	%
Commodity Credit Corporation	\$0	\$ 0	\$ 0	\$0	%
Crop insurance proceeds and federal crop disaster payments	\$200,000	100 %	0 %	\$0	\$
Specified custom hire (machine work) income	\$150,000	\$ 0	\$ 0	\$150,000	%
Other income	\$12,500	\$ 0	\$ 0	\$12,500	%

Enterprise Allocation



Allocate your enterprise information

Follow the prompts to specify your enterprises, assigning attributes such as Type, Class, and Commodity. You can add as many types of enterprises as needed by using the "Add" button.

Choose your enterprise

Select an Enterprise

Enterprise Type -Select-

Berry Crops

Cereal Grains

Feed

Legumes

Nut Crops

Oil

Row Crops

Seed

Tree Fruit

Vine Crops



Your enterprises so far:

Enterprise	Enterprise Type
------------	-----------------

Enterprise Allocation



Allocate your enterprise information

Follow the prompts to specify your enterprises, assigning attributes such as Type, Class, and Commodity. You can add as many types of enterprises as needed by using the "Add" button.

Choose your enterprise

Select an Enterprise

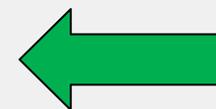
Enterprise Type

Commodity

Class/Variety

Market

- ✓ -Select-
- Sweet, Benton
- Sweet, Bing
- Sweet, Chelan
- Sweet, Lapins
- Sweet, Other
- Sweet, Pollinizers
- Sweet, Rainier
- Sweet, Regina
- Sweet, Royal Ann
- Sweet, Skeena
- Sweet, Sweetheart
- Tart, Amarelle
- Tart, Montmorency
- Tart, Morello



Your enterprises so far:

Enterprise	Enterprise Type

Back

Enterprise Allocation



Allocate your enterprise information

Follow the prompts to specify your enterprises, assigning attributes such as Type, Class, and Commodity. You can add as many types of enterprises as needed by using the "Add" button.

Choose your enterprise

Select an Enterprise

Enterprise Type

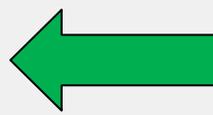
Commodity

Class/Variety

Market -Select-
 Conventional
 GMO
 Local
 Natural
 Organic
 Other

Your enterprises so far:

Enterprise	Enterprise Type	Production/Commod
------------	-----------------	-------------------



Data is Always in Season.™

Back

Allocate your enterprise information

Follow the prompts to specify your enterprises, assigning attributes such as Type, Class, and Commodity. You can add as many types of enterprises as needed by using the "Add" button.

Choose your enterprise

Select an Enterprise

Add

Your enterprises so far:

Enterprise	Enterprise Type	Production/Commodity Type	Class	Market	Actions
Crop	Tree Fruit	Cherries	Sweet, Bing	Conventional	Delete

Enterprise Type	Production/Commodity Type	Class	Market
Tree Fruit	Cherries	Sweet, Bing	Conventional

Enterprise Budget for Bing Cherry, can be at the block level!

Gross Income

Gross Return	Unit Sold by/as	Quantity of Units Sold	Price per Unit Sold	Total Value per Acre
Honeycrisp Apples	Bin	43.00	\$650.00	\$27,950.00
Total Gross Returns				\$27,950.00

Add New

General Cash Costs

Name	Unit	Quantity	Price per Unit	Total Cost per Acre
Chemicals	Acre	1.00	\$1,200.00	\$1,200.00
Cost of Goods Sold	Acre	1.00	\$10,013.26	\$10,013.26
Fertilizers and lime	Acre	1.00	\$350.00	\$350.00
Freight and Trucking	Acre	1.00	\$480.00	\$480.00
Gasoline, fuel, and oil (1)	Acre	1.00	\$140.00	\$140.00
Interest on loans and mortgages	Acre	1.00	\$624.42	\$624.42
Labor hired (less employment credits)	Acre	1.00	\$3,210.00	\$3,210.00
Other Expenses	Acre	1.00	\$792.91	\$792.91
Repairs and maintenance (2)	Acre	1.00	\$220.00	\$220.00
Supplies	Acre	1.00	\$45.00	\$45.00
Utilities	Acre	1.00	\$200.00	\$200.00
Total General Costs				\$17,275.59

Add General Cost

Totals

Total Gross Returns	\$27,950.00
Total Costs	\$17,275.59
Net Returns (income minus costs)	\$10,674.41

**Using *AgBiz Logic* to Make
Investment Decisions:
*An AgBiz Logic Case Study***



Questions or Comments!