

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

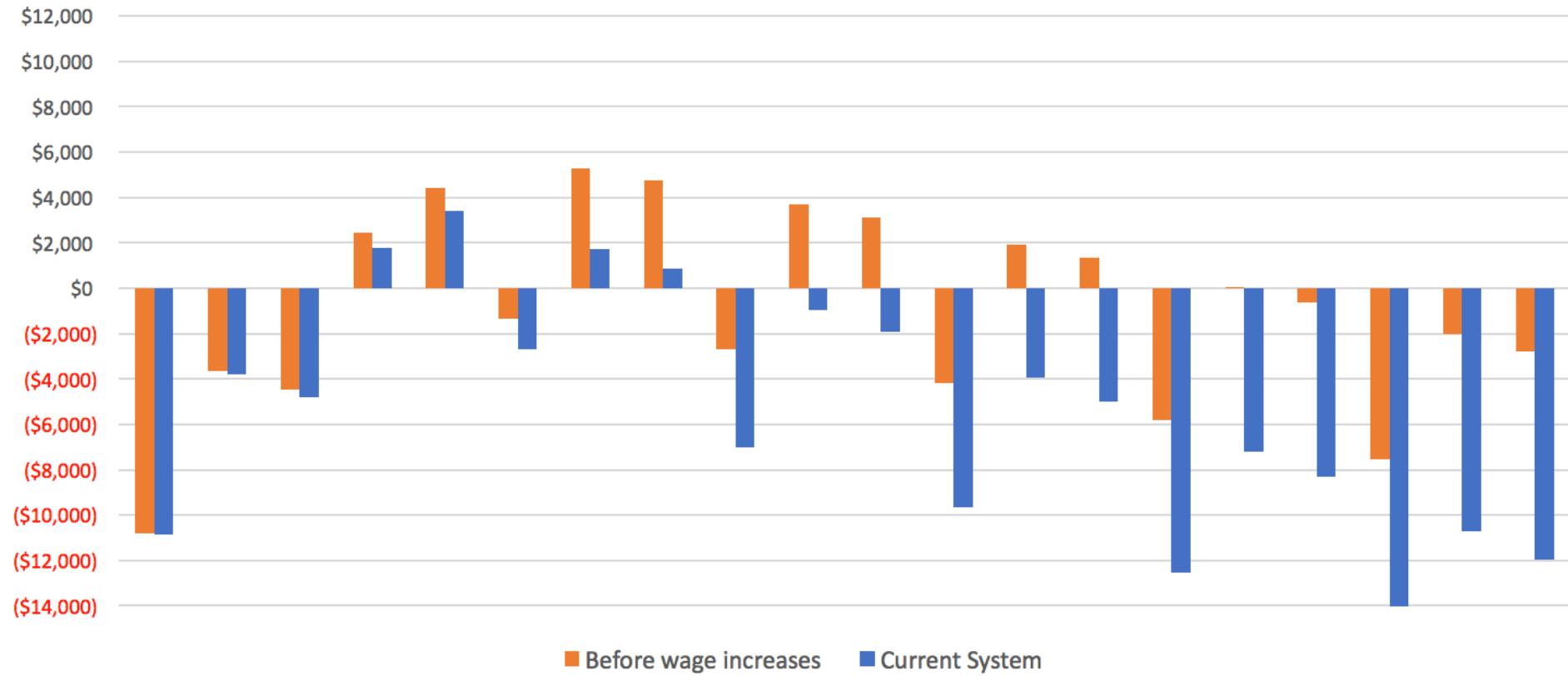


Clark Seavert  
Professor, Department of Applied Economics  
Executive Director, NW Agribusiness Executive Seminar  
Oregon State University

## 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*

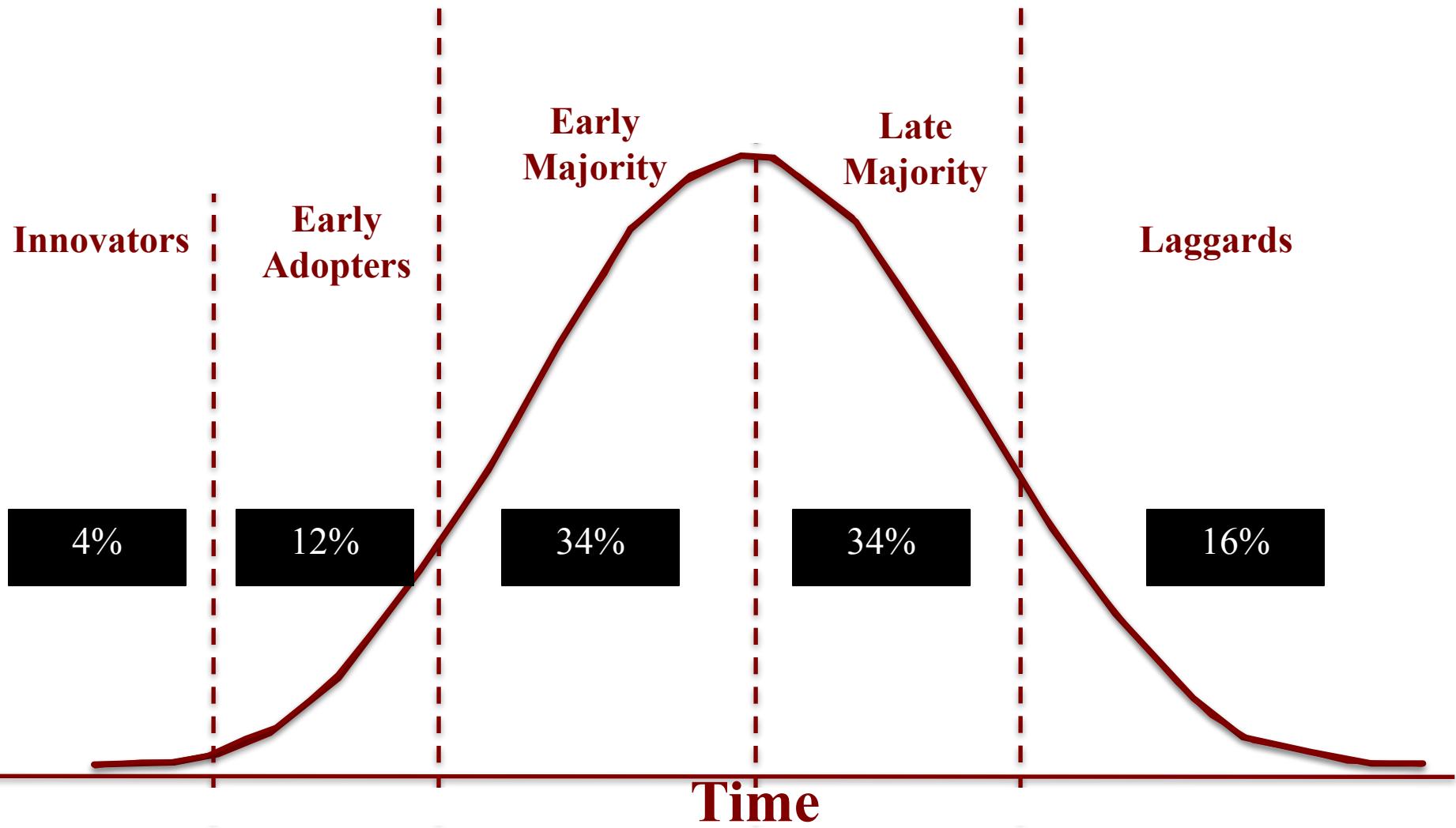
- Immigration Reform
- Fully automated harvesters?
  - *Cost of a machine*
  - *Number of machines required*
  - *Purchase vs. custom hire*

## 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**

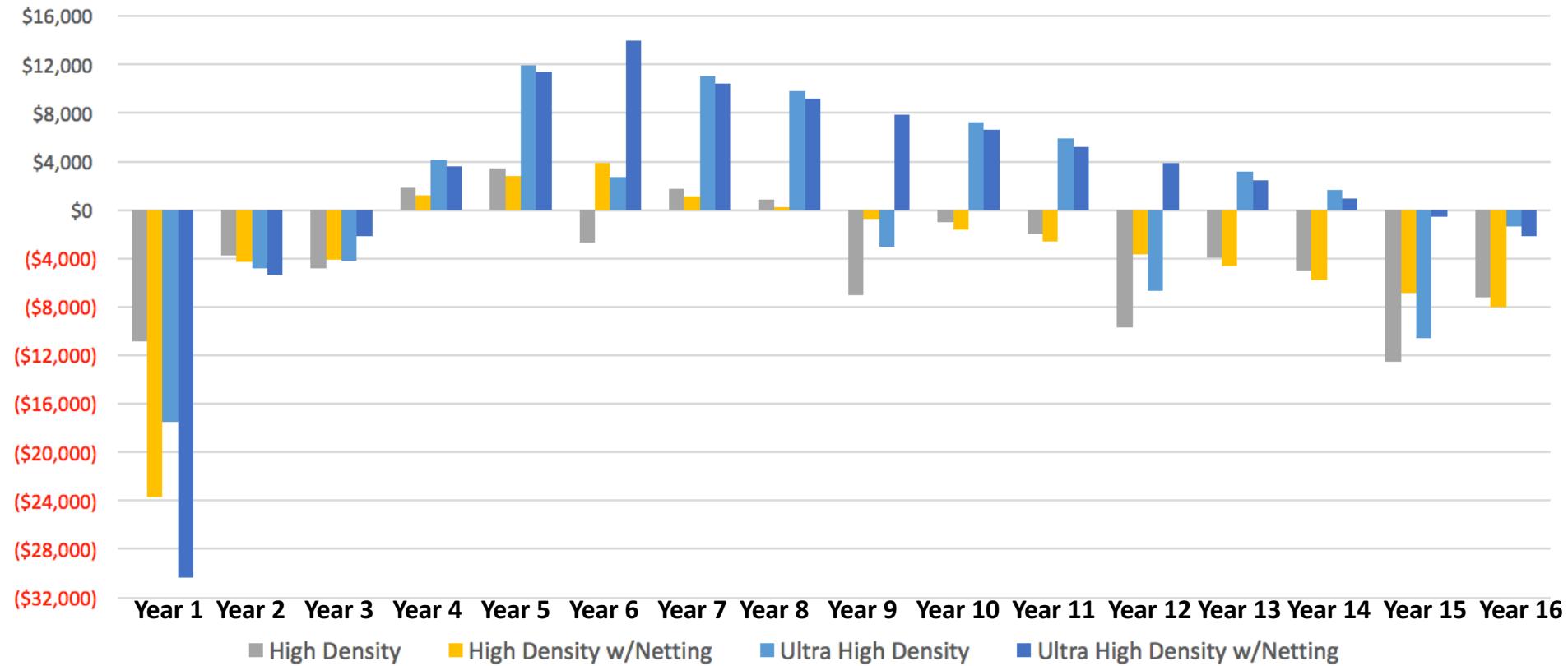
**Labor Rates Assumed in *AgBiz Logic* Scenario**

	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
<b>Adjusted Yields</b>	<b>0</b>	<b>0</b>	<b>4,740</b>	<b>17,380</b>	<b>23,700</b>
High Density w/Netting	0	0	3,000	11,000	15,000
<b>Adjusted Yields</b>	<b>0</b>	<b>0</b>	<b>4,200</b>	<b>15,400</b>	<b>21,000</b>
Ultra High Density	0	0	5,000	10,200	20,400
<b>Adjusted Yields</b>	<b>0</b>	<b>0</b>	<b>5,350</b>	<b>10,914</b>	<b>21,828</b>
Ultra High Density w/Netting	0	0	5,000	10,200	20,400
<b>Adjusted Yields</b>	<b>0</b>	<b>0</b>	<b>5,100</b>	<b>10,404</b>	<b>20,808</b>

	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
<b>Adjusted Yields</b>	<b>0</b>	<b>0</b>	<b>4,950</b>	<b>18,150</b>	<b>24,750</b>
High Density w/Netting	0	0	3,000	11,000	15,000
<b>Adjusted Yields</b>	<b>0</b>	<b>0</b>	<b>4,500</b>	<b>16,500</b>	<b>22,500</b>
Ultra High Density	0	0	5,000	10,200	20,400
<b>Adjusted Yields</b>	<b>0</b>	<b>0</b>	<b>5,900</b>	<b>12,036</b>	<b>24,072</b>
Ultra High Density w/Netting	0	0	5,000	10,200	20,400
<b>Adjusted Yields</b>	<b>0</b>	<b>0</b>	<b>5,500</b>	<b>11,220</b>	<b>22,440</b>

**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*

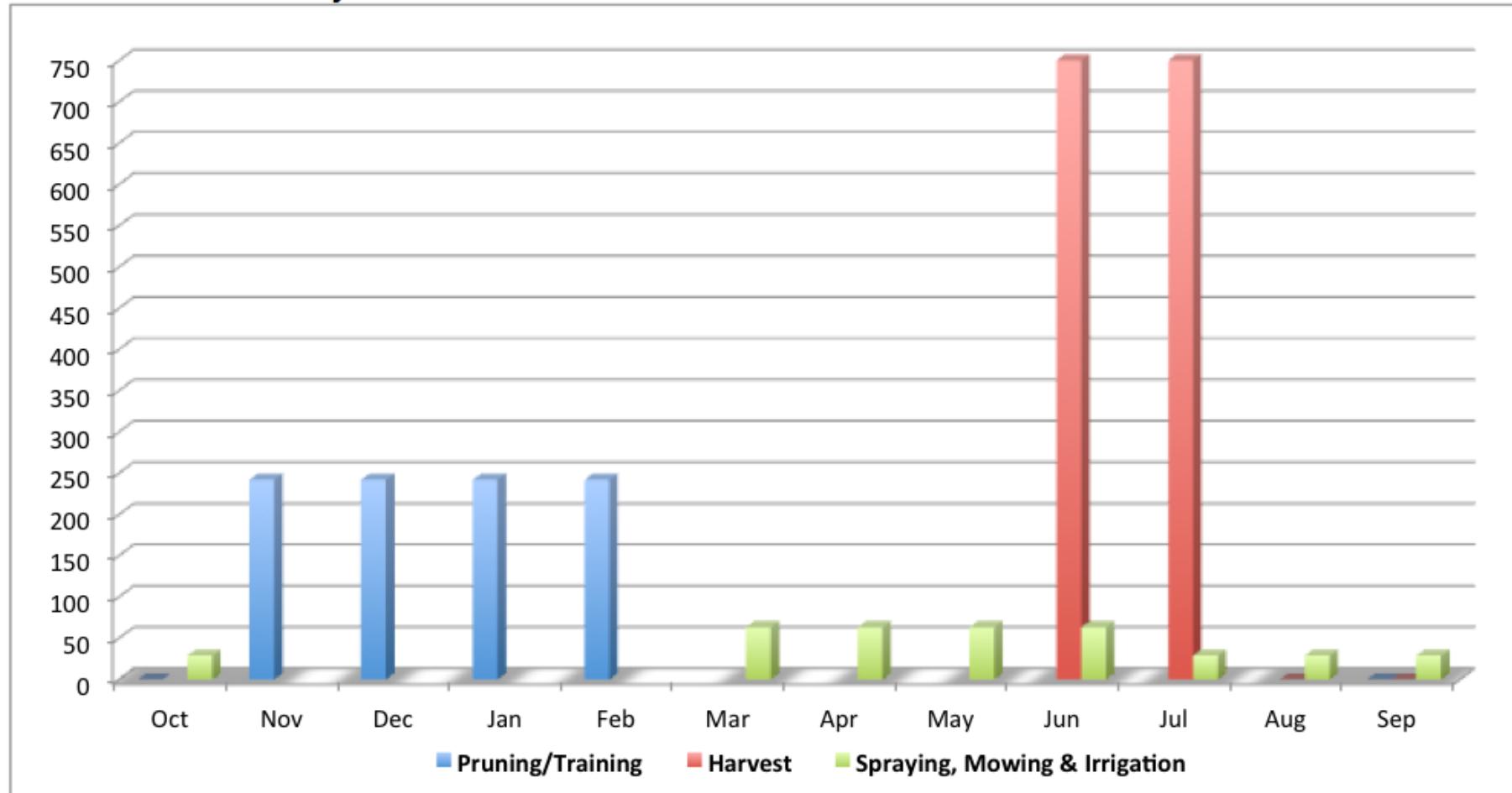
*Based on your goals:*

- *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 ÷ 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 ÷ 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>	<b>6.21</b>	<b>1.31</b>	<b>47.0</b>	<b>30%</b>	<b>1.61</b>
<i>Median</i>	<b>3.26</b>	<b>0.74</b>	<b>35.0</b>	<b>14%</b>	<b>0.95</b>
<i>Lower Quartile</i>	<b>1.88</b>	<b>0.42</b>	<b>19.0</b>	<b>4%</b>	<b>0.53</b>

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



AgBiz Logic™

Username

Password

Log in

Sign up

# 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.

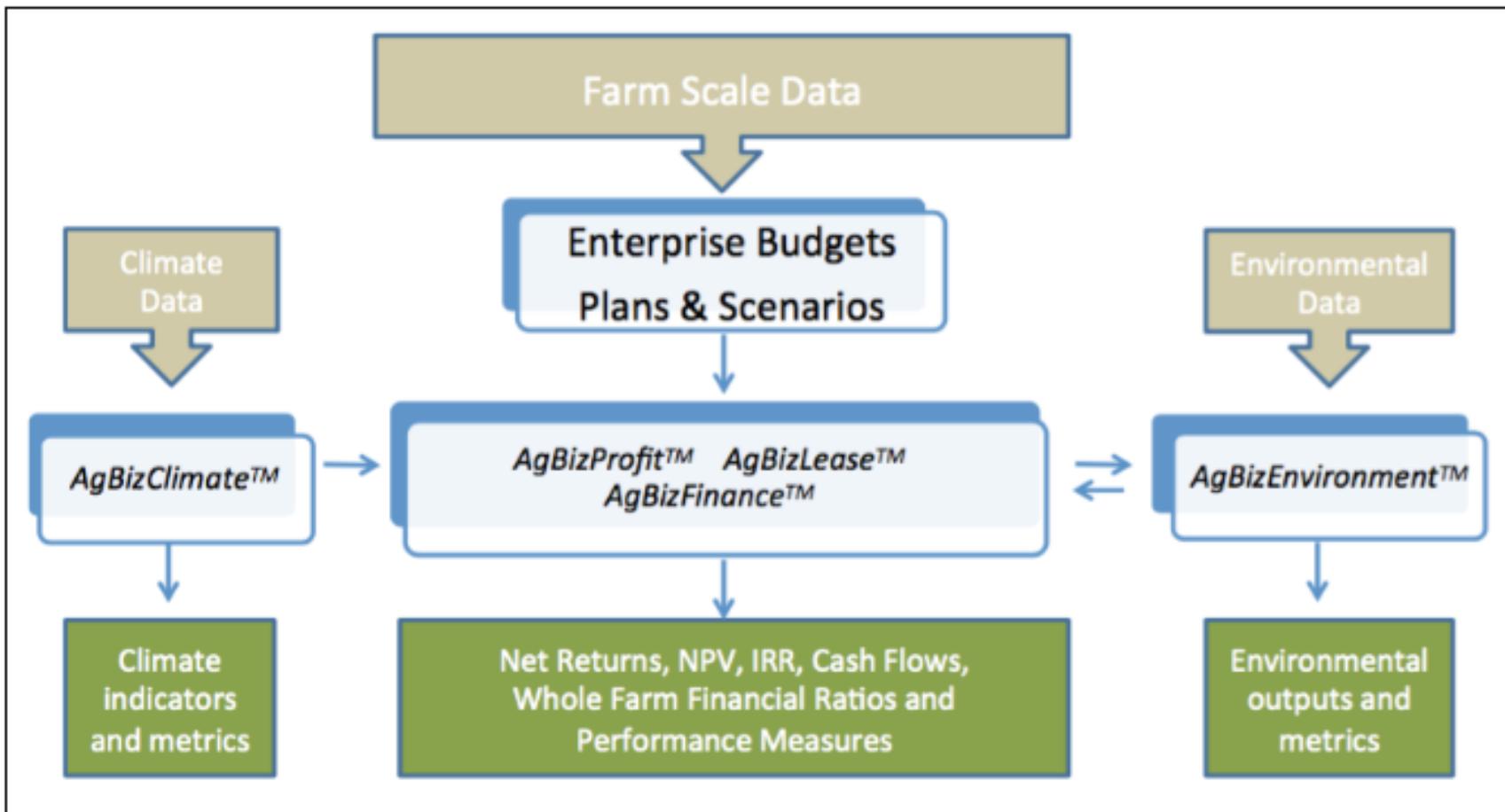
[Sign Up Free](#)

**[www.agbizlogic.com](http://www.agbizlogic.com)**

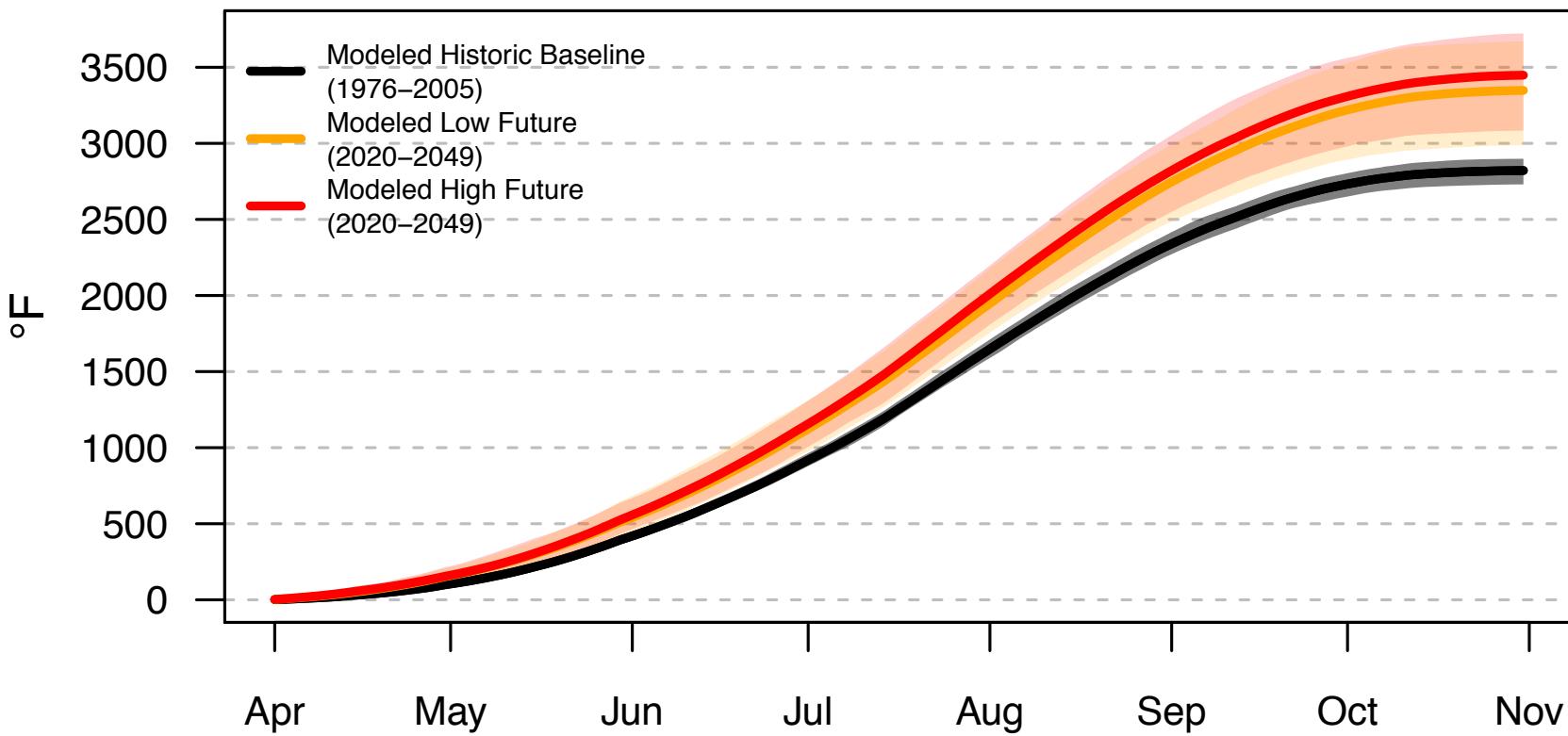
# What is *AgBiz Logic*?

*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.

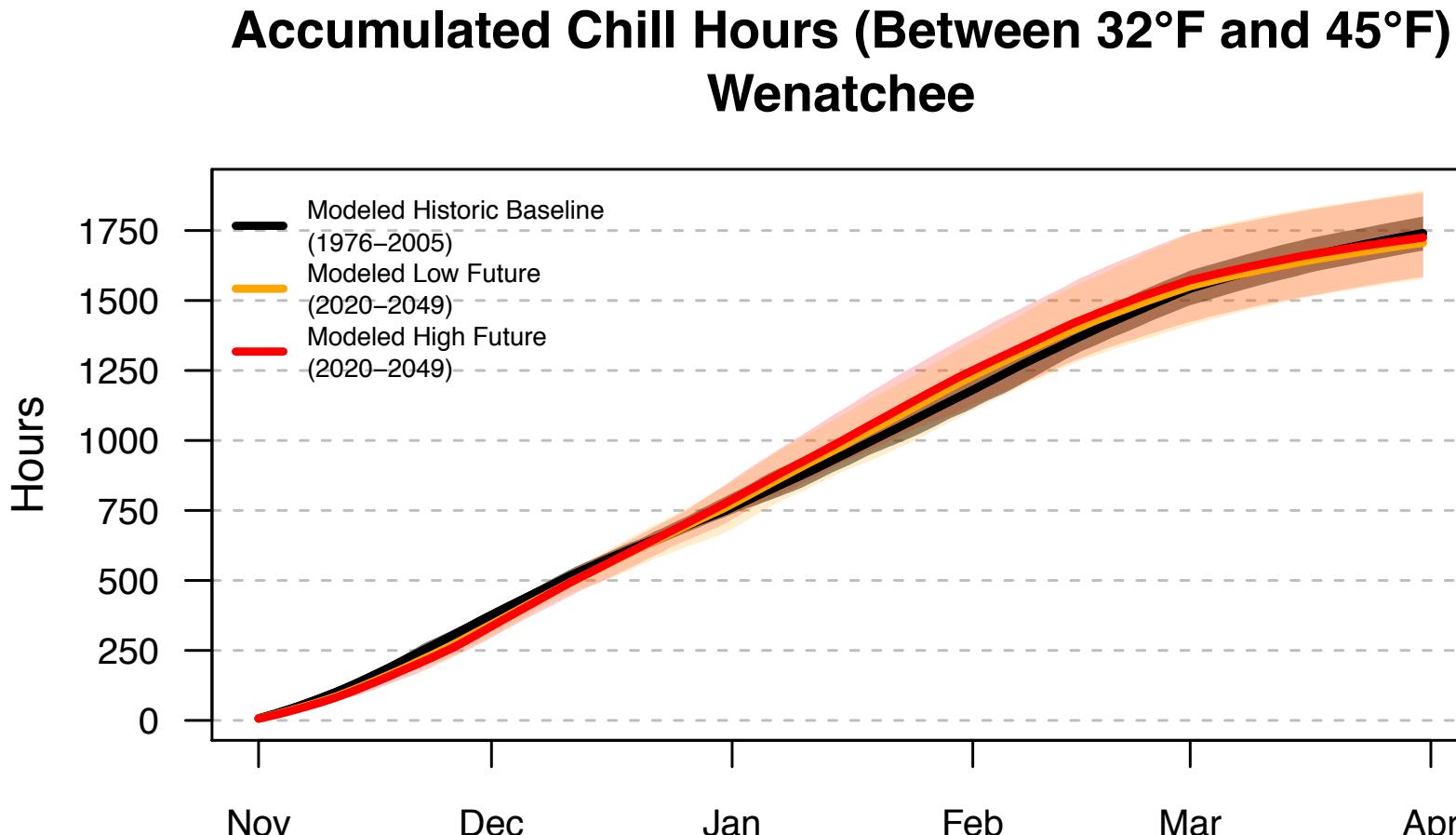
# *AgBiz Logic Platform*



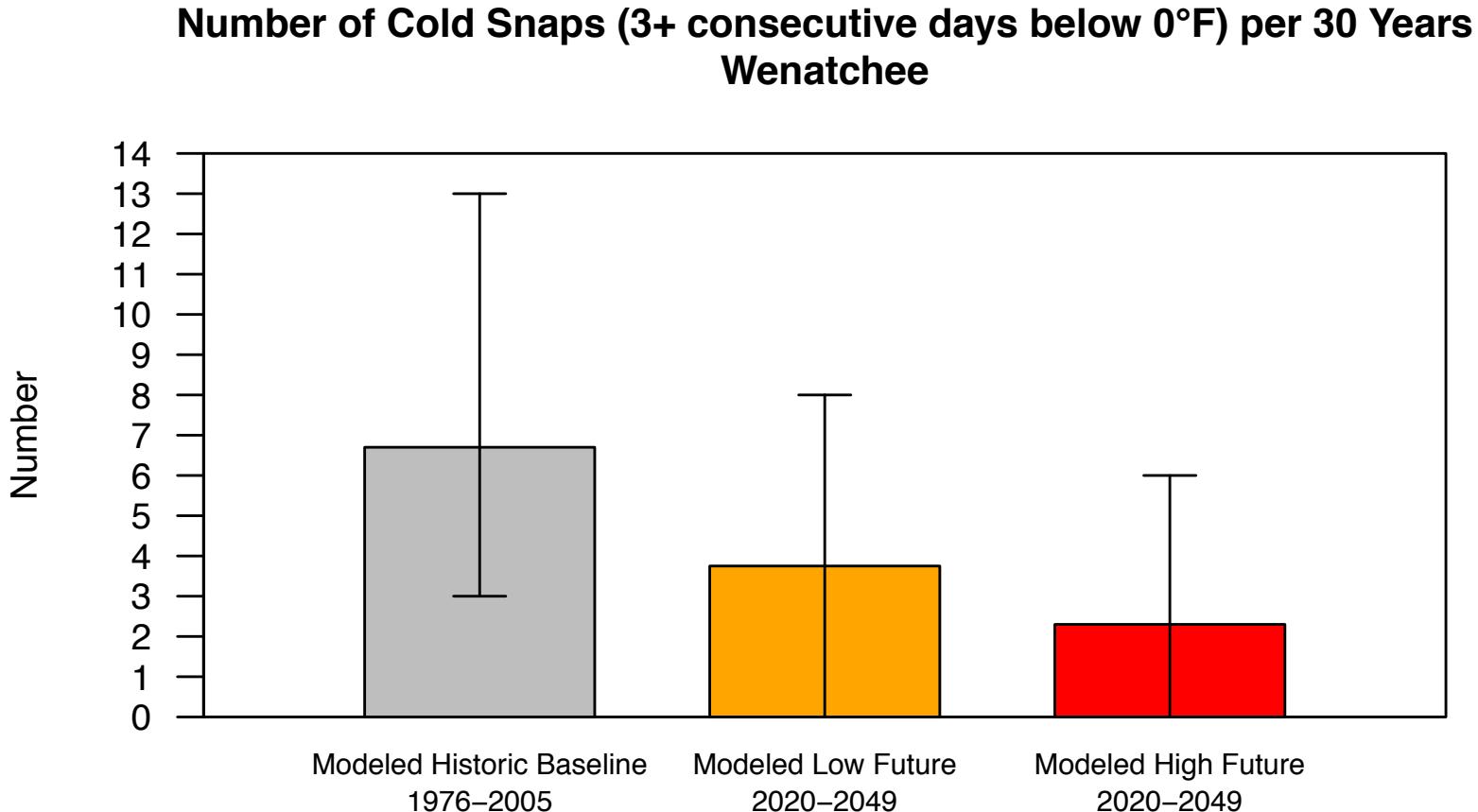
# Accumulated Growing Degree Days (Base 50°F) Wenatchee



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.



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.



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 <small>?</small>	Livestock <small>?</small>	Whole Farm <small>?</small>	\$ or % <small>?</small>
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

Market

Crop

- Select-
- Berry Crops
- Cereal Grains
- Feed
- Legumes
- Nut Crops
- Oil
- Row Crops
- Seed
- Tree Fruit
- Vine Crops

### Your enterprises so far:

Enterprise

Enterprise Type

10100

01101

11010

10110

# 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.

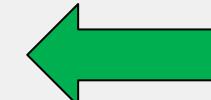
Choose your enterprise

Select an Enterprise	Crop
Enterprise Type	Tree Fruit
Commodity	Cherries
Class/Variety	-Select-
Market	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



10100

01101

11010

10110

# Enterprise Allocation



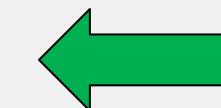
## Allocate your enterprise information

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	Crop
Enterprise Type	Tree Fruit
Commodity	Cherries
Class/Variety	Sweet, Bing
Market	<ul style="list-style-type: none"><li>✓ -Select-</li><li>Conventional</li><li>GMO</li><li>Local</li><li>Natural</li><li>Organic</li><li>Other</li></ul>



## Your enterprises so far:

Enterprise	Enterprise Type	Production/Commodity

## 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	<input type="button" value="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
<b>Total Gross Returns</b>				<b>\$27,950.00</b>

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
<b>Total General Costs</b>				<b>\$17,275.59</b>

Add General Cost

## Totals

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

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



Questions or Comments!