Hazelnut Economics:

- **Cost and Returns of Establishing a Standard vs. Double Density Orchard**
- **Rejuvenating an Existing Orchard**
- **Establishing an Equitable Lease**
- **Structuring Management Agreement**

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Executive Director, NW Agribusiness Executive Seminar
Oregon State University

www.agbizlogic.com check out our resources page for this presentation

Orchard Renewal Decisions should be based on Capital Investment Analysis

Capital investment analysis is a budgeting procedure to <u>assess the potential profitability</u> of a long-term investment. The goal is to <u>pinpoint the the most likely profitable option</u>, at a minimum, based on a <u>discounted cash flow analysis</u> – 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
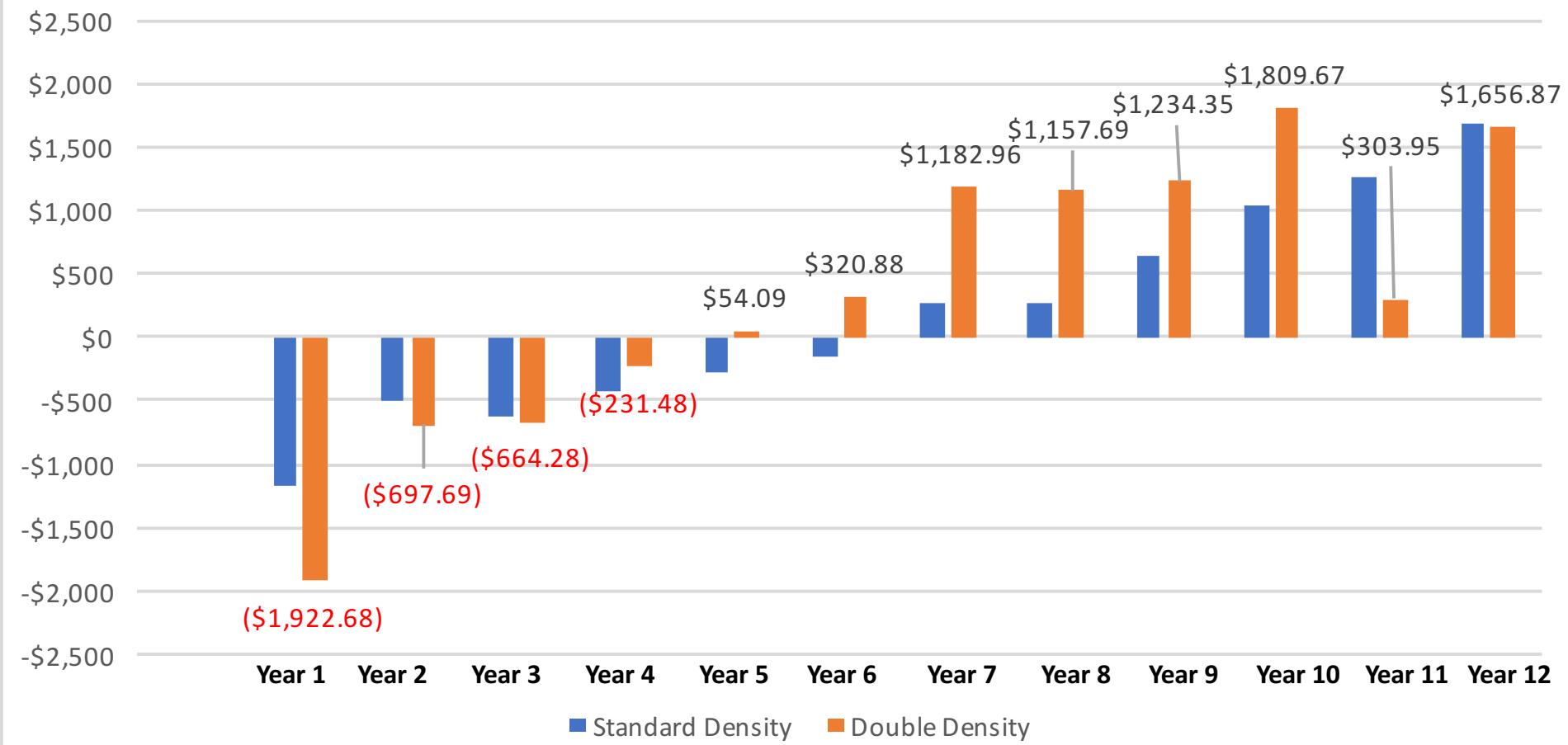
# *THREE Key Factors to Successful Orchard Renewal*

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

Hazelnut Yields Assumed in *AgBiz Logic* Scenario
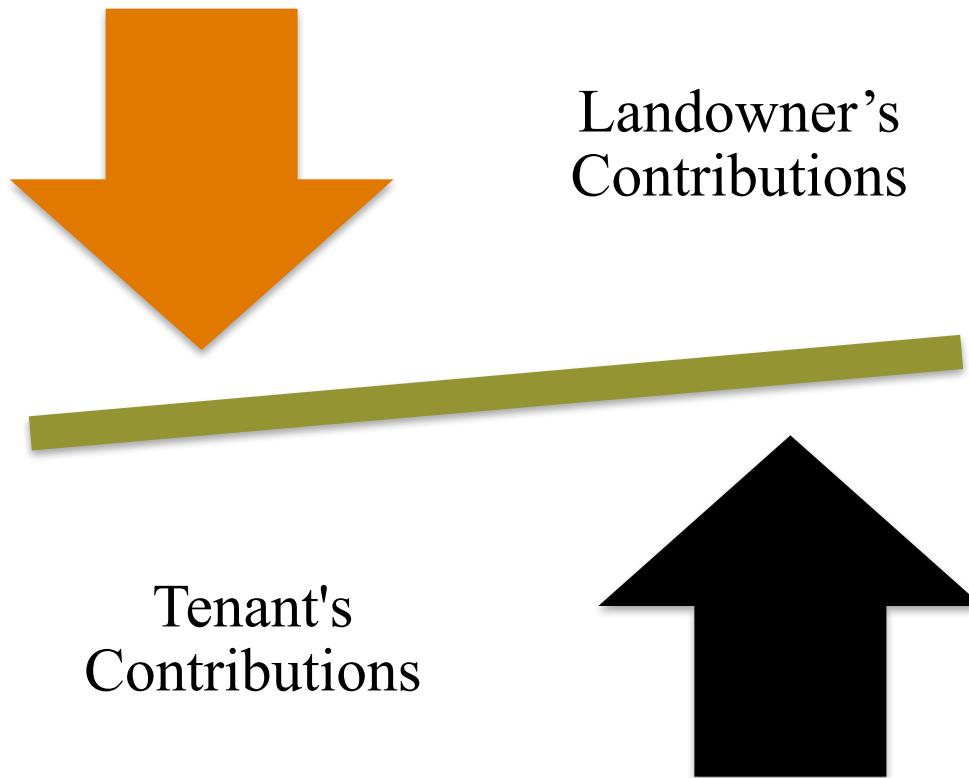
	Standard Density	Double Density
Year 1	0	0
Year 2	0	0
Year 3	75	150
Year 4	285	570
Year 5	440	880
Year 6	600	1,200
Year 7	1,100	2,200
Year 8	1,200	2,300
Year 9	1,600	2,400
Year 10	2,000	3,000
Year 11	2,300	2,300
Year 12	2,800	2,800

Net Returns of Establishing a Standard and Double Density Hazelnut Orchard

$1.00 per Pound		$1.25 per Pound	
Standard Density	**Double Density**	**Standard Density**	**Double Density**
Net Present Value 6% Discount Rate		**Net Present Value 6% Discount Rate**	
$ 1,019	$ 2,203	$4,977	$7,035
Internal Rate of Return		**Internal Rate of Return**	
$10k/$20k Land Value		**$10k/$20k Land Value**	
6.51%	7.09%	8.33%	9.29%
$15k/$20k Land Value		**$15k/$20k Land Value**	
4.37%	4.86%	5.99%	6.79%

An equitable lease is one that compensates the tenant and landowner proportional to their contributions to the production of a crop for the duration of a lease.

Landowner's Contributions

Tenant's Contributions

Total Costs of Establishing a Standard Density Hazelnut Orchard
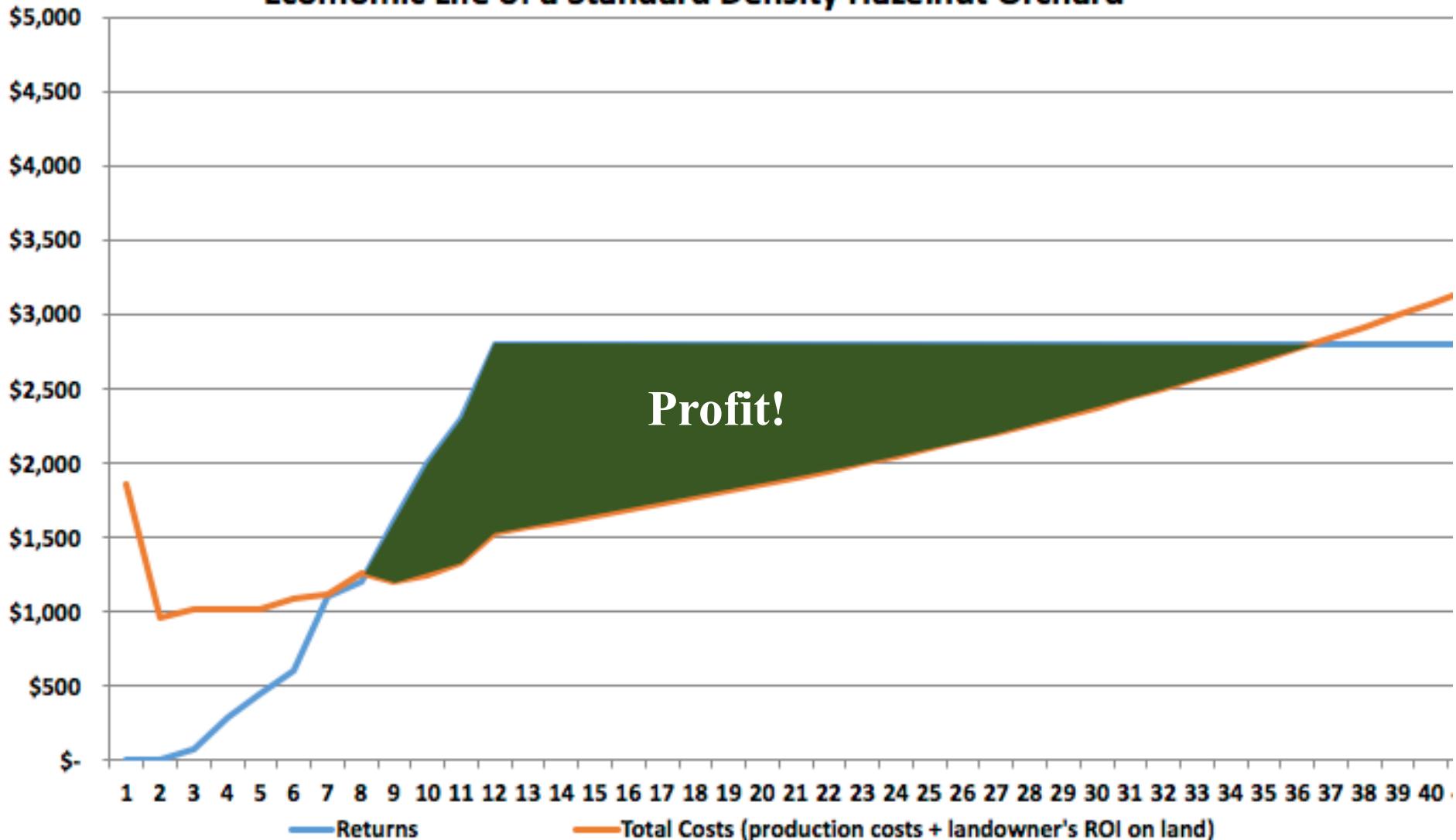
Costs/Value of Investment	Landowner's Share	Tenant's Share
Land	✔	
Property Taxes	✔	
Irrigation System/Assessment	✔	
Long-term Assets on the Land*	✔	
Buildings/Shop/Similar Assets*	✔	✔
Machinery and Equipment*	✔	✔
Trucks, Vehicles, ATV, etc.*	✔	✔
Production Inputs	✔	✔

*That are used in the production of Hazelnuts for this lease only
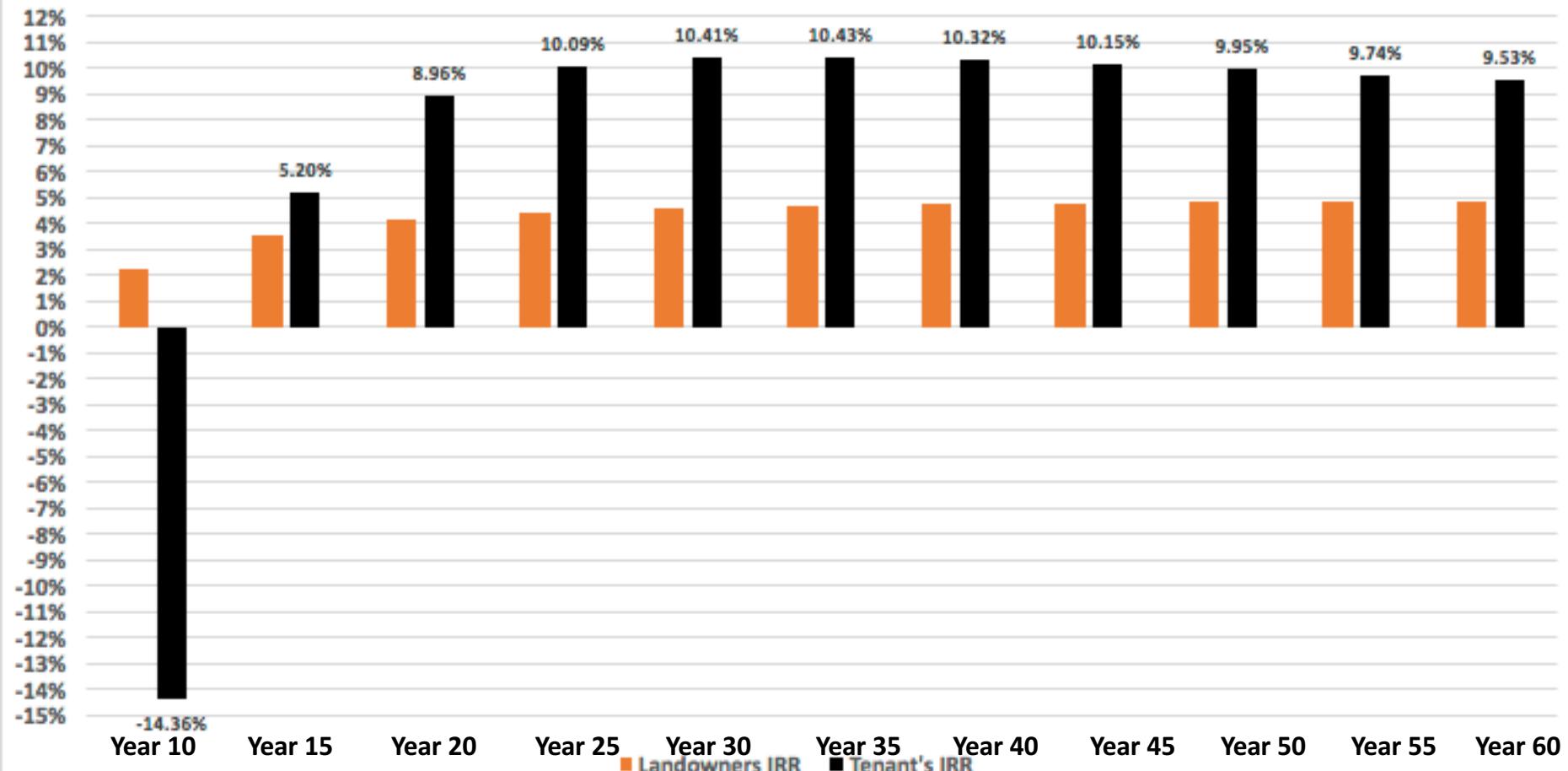
| Landowner's Investment Parameters:		
Value of land investment:	$	10,000
Annual rate of land appreciation (%):		0.50%
Annual rate of return on investment (ROI) of land (%):		3.00%
Inflation rate for the improvements on the land (%):		2.00%
Beginning value of improvements on the land:	$	-
Ending value of improvements on the land:	$	(500.00)

Ecomomic Life of a Standard Density Hazelnut Orchard

Profit!

Legend: Returns — Total Costs (production costs + landowner's ROI on land)
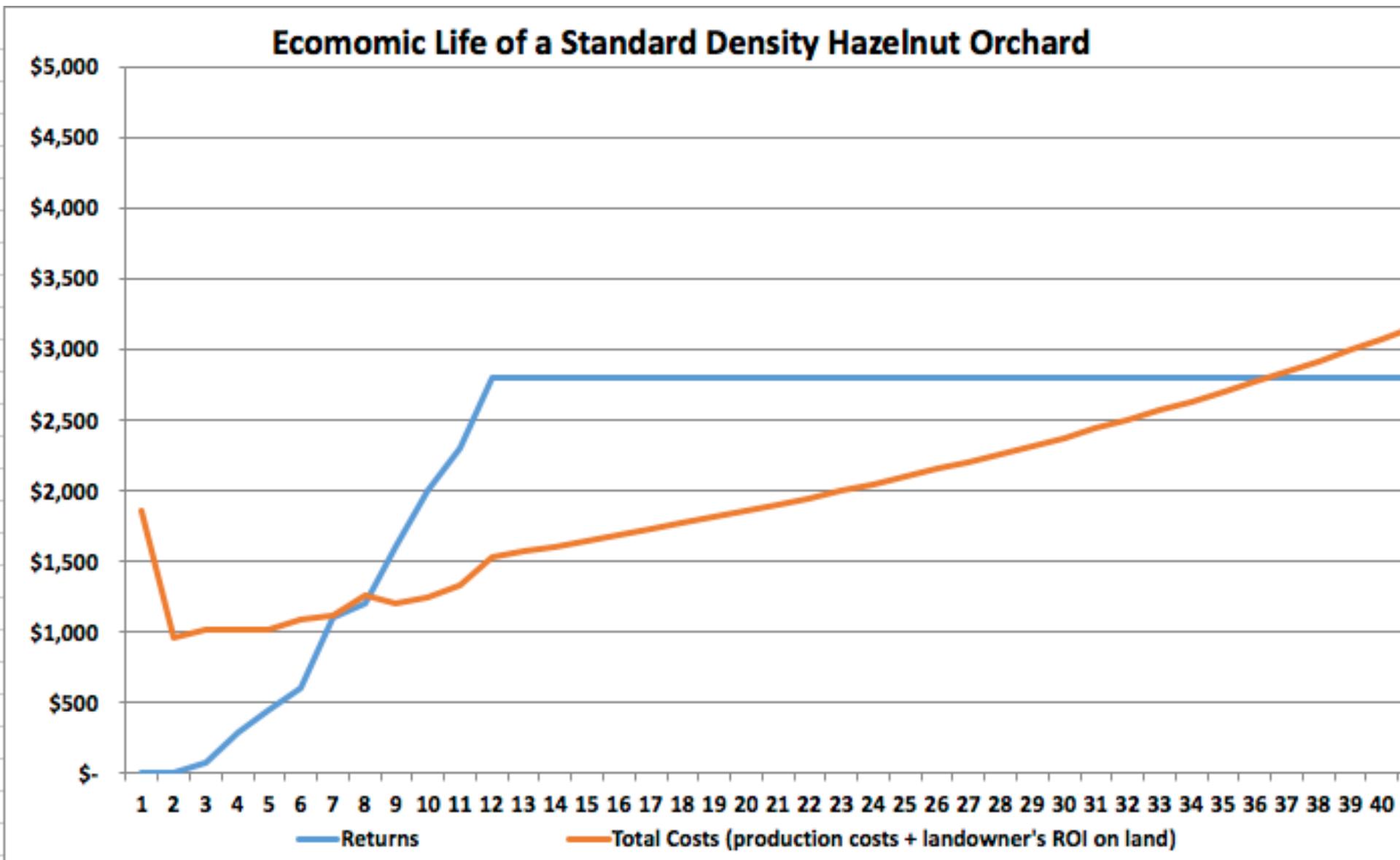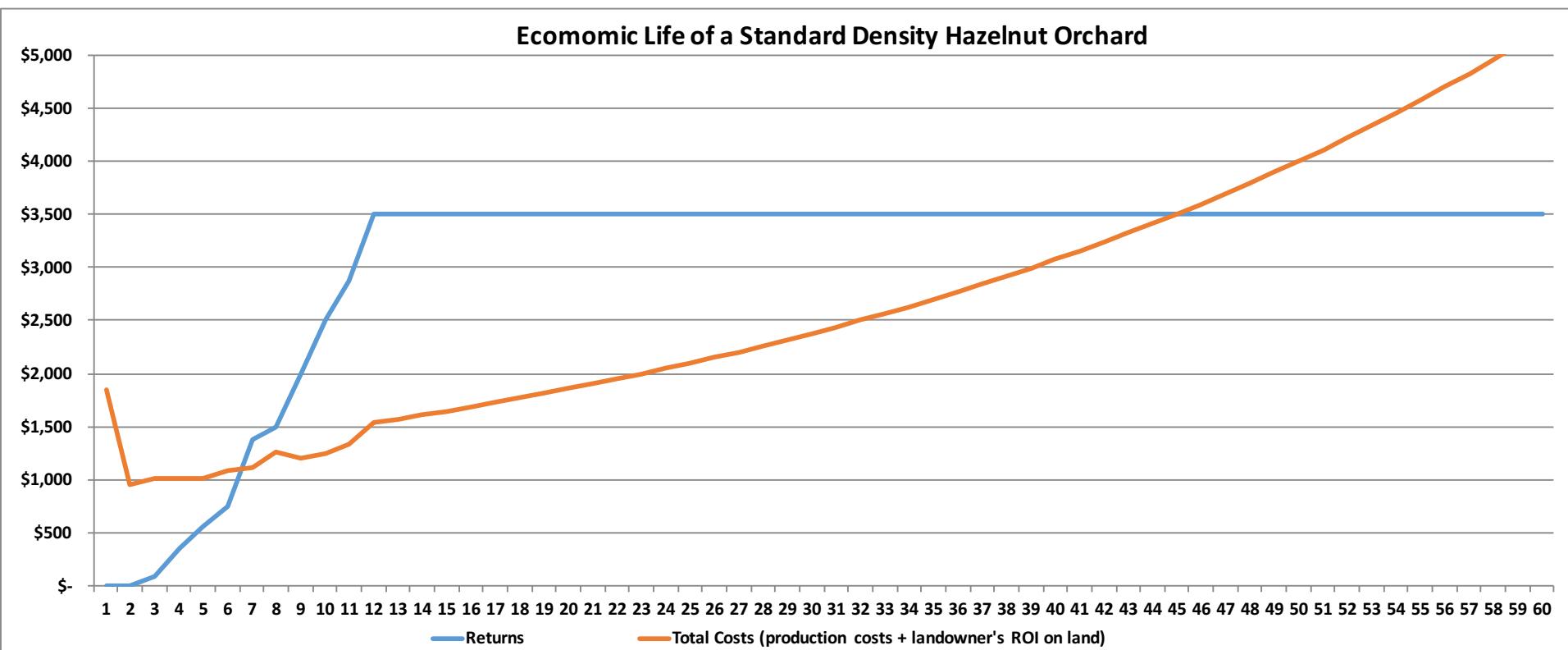
Internal Rate of Return (ROI) for Establishing a Standard Density Hazelnut Orchard for Landowner and Tenant , 60 Years
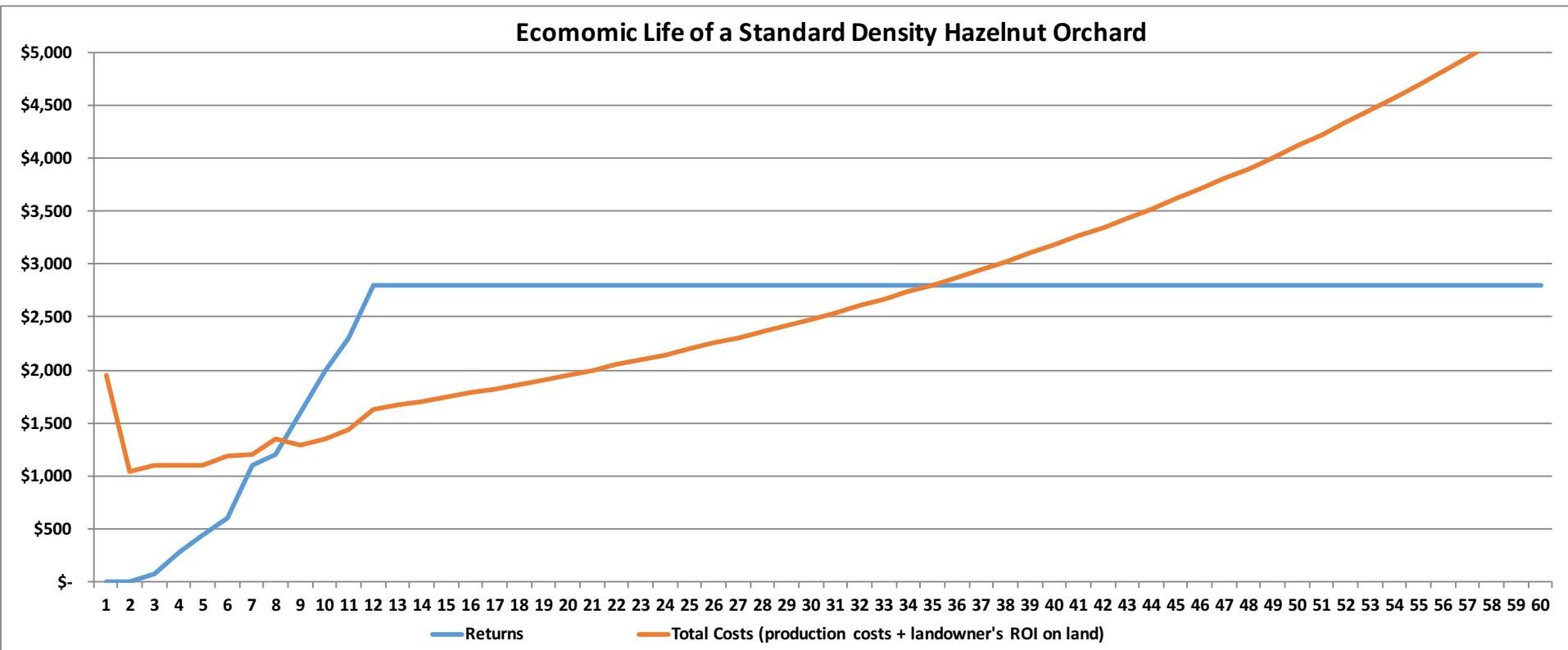
| Year	Landowners IRR	Tenant's IRR
Year 10		-14.36%
Year 15		5.20%
Year 20		8.96%
Year 25		10.09%
Year 30		10.41%
Year 35		10.43%
Year 40		10.32%
Year 45		10.15%
Year 50		9.95%
Year 55		9.74%
Year 60		9.53%

Assumed $1.00/Lb Nuts, No Price Inflation, 3% Inflation on Costs; $12,000/acre Land
Economic Life of Orchard = 36 Years

Ecomomic Life of a Standard Density Hazelnut Orchard

Legend: Returns | Total Costs (production costs + landowner's ROI on land)
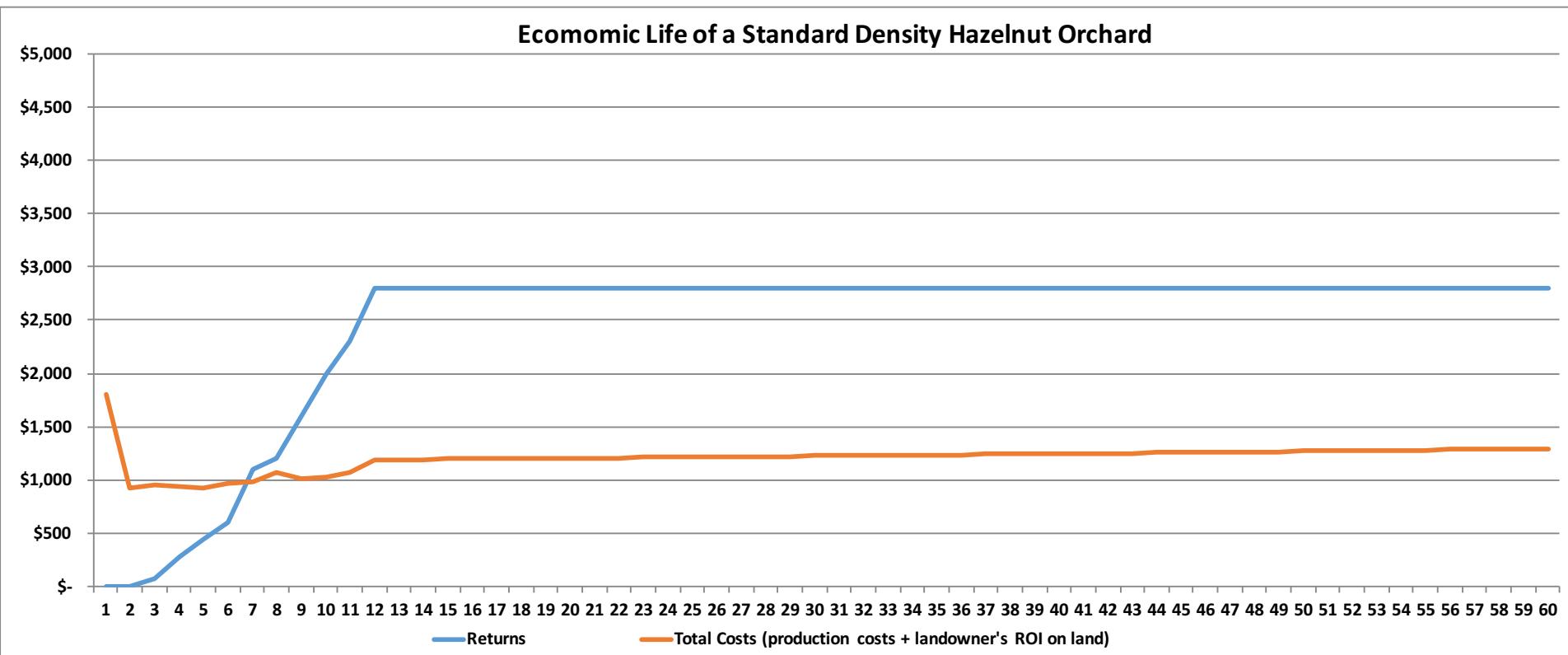
Assumed **$1.25/Lb Nuts**, No Price Inflation, 3% Inflation on Costs; $12,000/acre Land
Economic Life of Orchard = 45 Years

Ecomomic Life of a Standard Density Hazelnut Orchard

— Returns
— Total Costs (production costs + landowner's ROI on land)

Assumed $1.00/Lb Nuts, No Price Inflation, 3% Inflation on Costs; **$15,000/acre Land** **Economic Life of Orchard = 34 Years**

Ecomomic Life of a Standard Density Hazelnut Orchard

Returns — Total Costs (production costs + landowner's ROI on land)

Assumed $1.00/Lb Nuts, No Price Inflation, **0% Inflation on Costs**; $12,000/acre Land
Economic Life of Orchard = Infinity

Ecomomic Life of a Standard Density Hazelnut Orchard

Legend: Returns — Total Costs (production costs + landowner's ROI on land)

Equitable Crop-Share Lease	
$1.00/lb Nuts; No Price Inflation; 3% Cost Inflation; 35 Year Lease	
Landowner Share	Tenant Share
29.55%	**70.45%**

Financial Feasibility		
	Landowner	Tenant
The year returns are greater than annual costs/investments:	9	9
The year returns are greater than total costs/investments of all previous years:	16	14
Total cash cost to implement:	$ 2,180	$ 3,380
Internal rate of return:	**8.43%**	**9.71%**

Annual Cash Rent Payments: Based on 3-Year, 5-Year and 10-Year Intervals

■ 3 Year Rent   ■ 5 Year Rent   ■ 10 Year Rent

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What is *AgBiz Logic?*

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

AgBiz Logic Platform

AgBizClimate
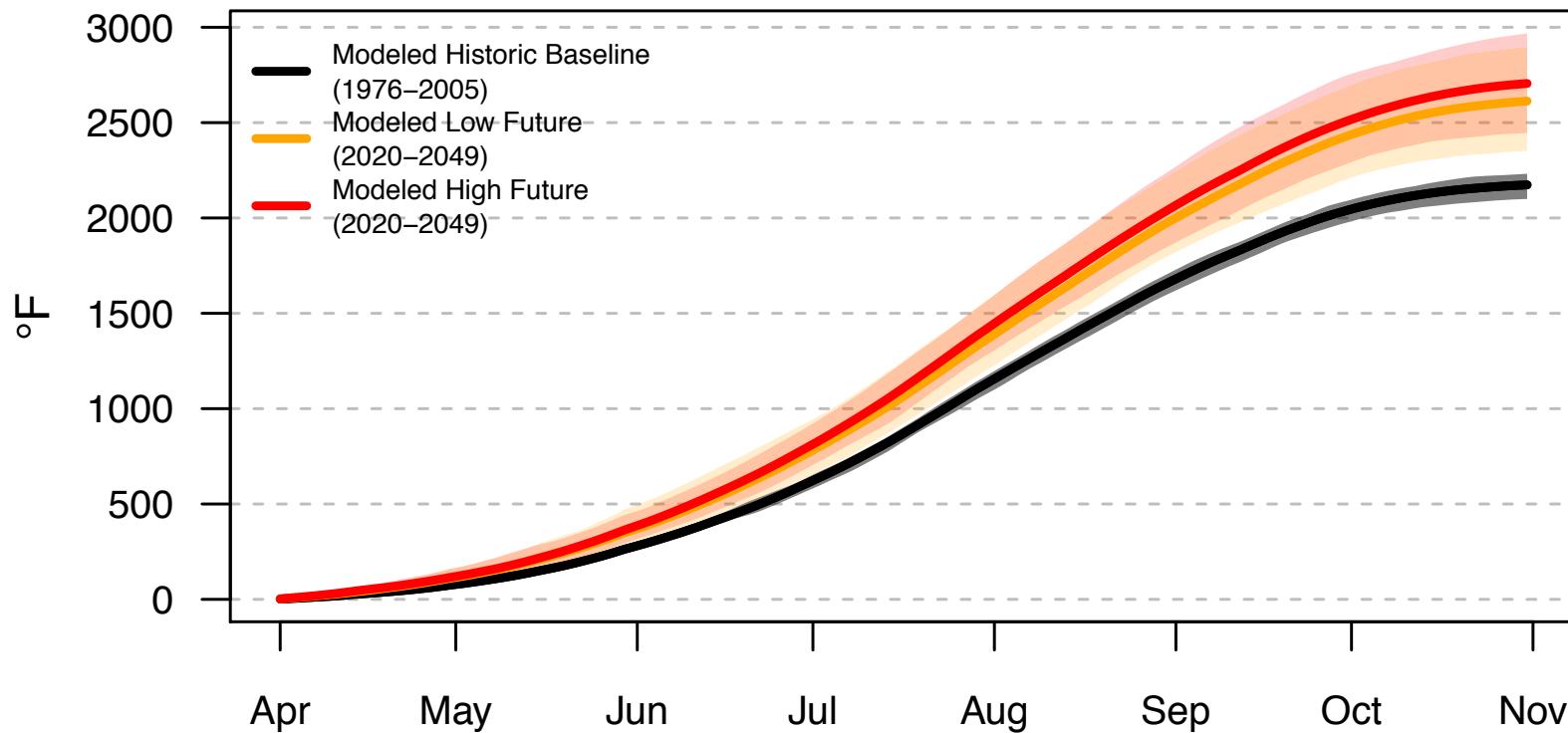
Add New Variable:

Selected Variables
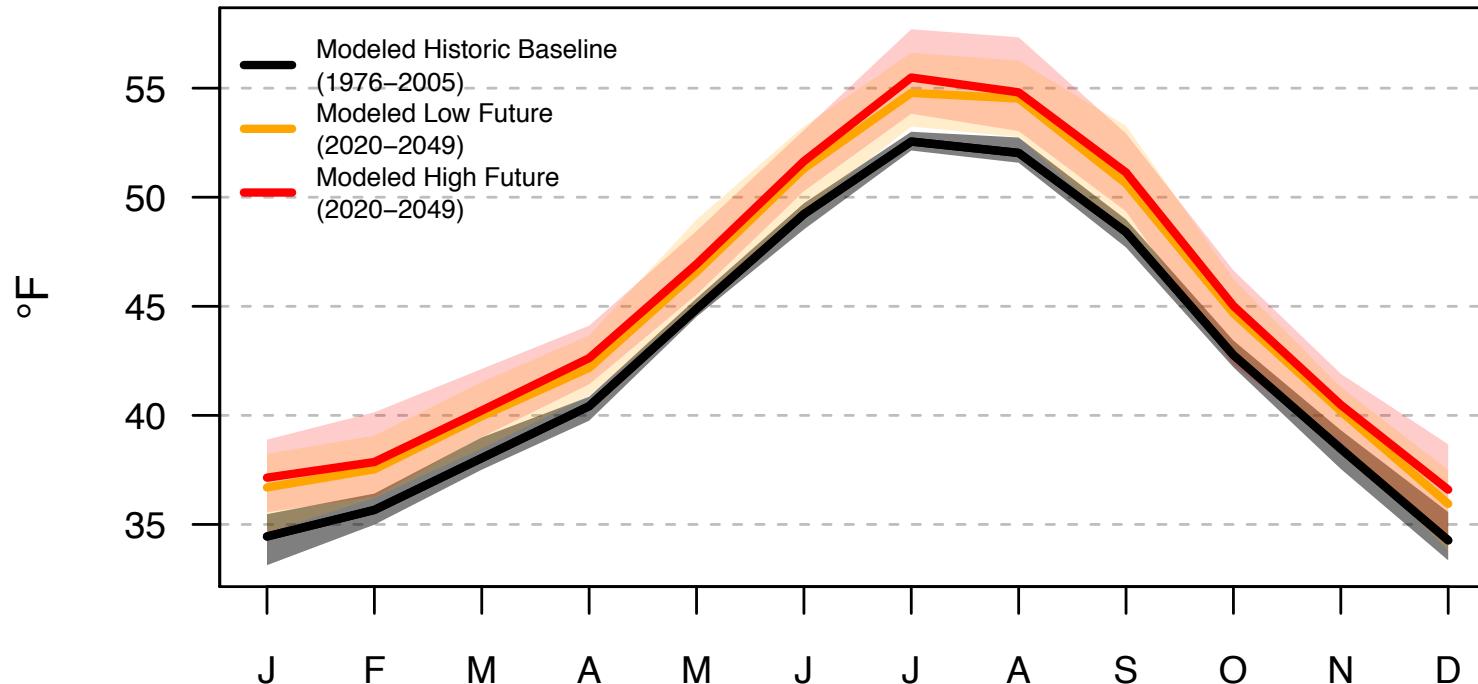
✓ Select
Number of Consecutive Dry Days
Number of Consecutive Wet Days
Number of Nights Below Freezing
Growing Season Length per Year
Number of Warm Nights
Number of Heat Wave Events
Number of Very Heavy Precipitation Days
Diurnal Temperature Range
Accumulated Seasonal Precipitation
Seasonal Minimum Temperature
Seasonal Maximum Temperature
Accumulated Chilling Hours
Accumulated Growing Degree Days

Add

Accumulated Growing Degree Days (Base 50°F) Corvallis

Legend:
- Modeled Historic Baseline (1976–2005)
- Modeled Low Future (2020–2049)
- Modeled High Future (2020–2049)
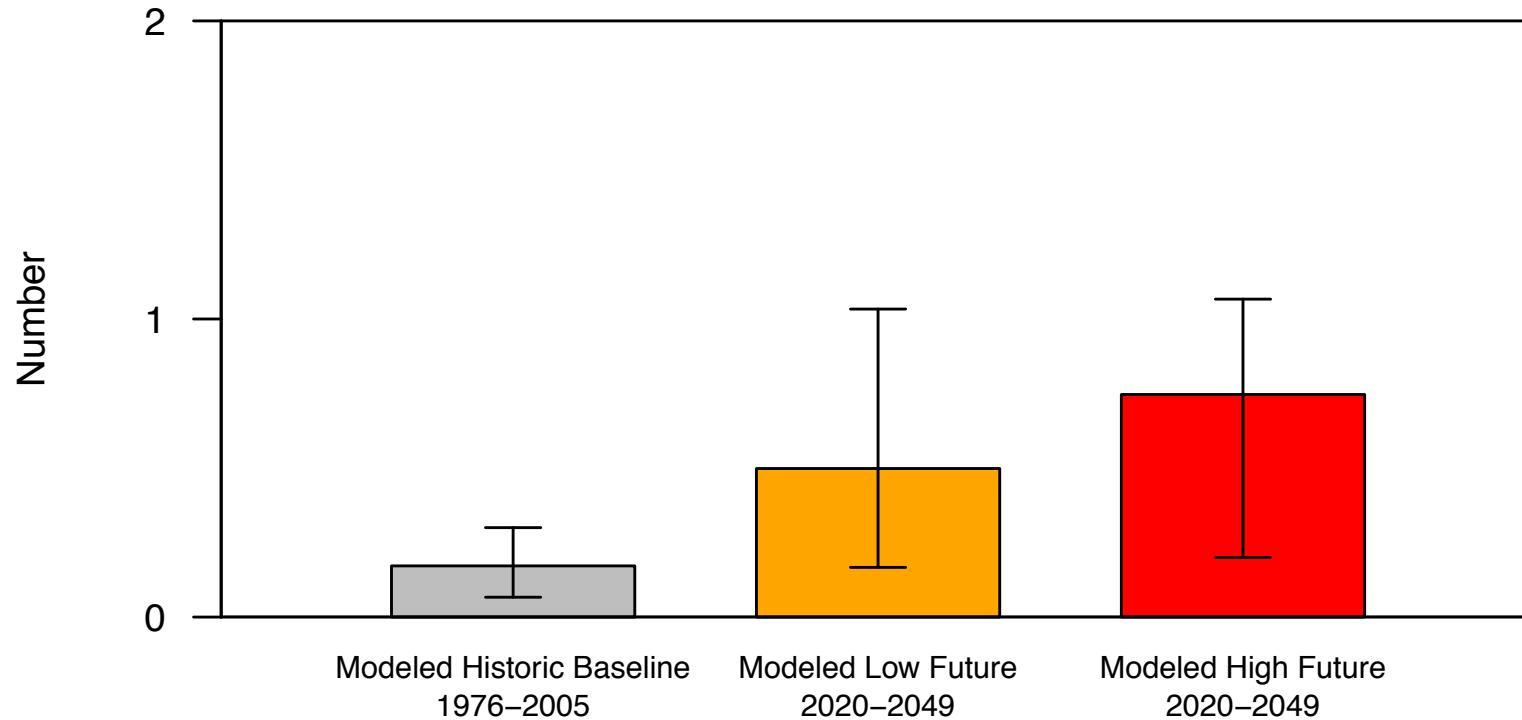
By the 2030s, accumulated growing degree days from April 1 to October 31 is expected to increase by 440 degree–hours for the low emissions future and by 532 degree–hours for the high emissions future compared with the historical baseline.

Minimum Temperature
Corvallis

Legend:
- **Modeled Historic Baseline** (1976–2005)
- **Modeled Low Future** (2020–2049)
- **Modeled High Future** (2020–2049)

Y-axis: °F

X-axis: J F M A M J J A S O N D

By the 2030s, minimum temperature is expected to increase during all months
by 1.7° to 2.5°F for the low emissions future and by 2° to 2.9°F for the high emissions future
depending on the month compared with the historical baseline.

**Number of Heat Waves per Year
Corvallis**

By the 2030s, the frequency of heat wave events (3+ consecutive days above 95°F) per year is expected to increase by 0.3 occurrences for the low emissions future and by 0.6 occurrences for the high emissions future compared with the historical baseline.

Data is Always in Season.™

Mean Temperature

Source: 1-Month Average NMME Forecasts
Downscaled to (44.5628N, 123.2305E)

Legend:
- Average Observed (1981-2010)
- Average Forecast

http://climate.nkn.uidaho.edu/REACCH/seasonalForecasts.php?latitude=44.5803&longitude=123.2135&pointName=

Precipitation

Source: 1-Month Average NMME Forecasts
Downscaled to (44.5628N ,123.2305E)

Legend:
- Average Observed (1981-2010)
- Average Forecast

http://climate.nkn.uidaho.edu/REACCH/seasonalForecasts.php?latitude=44.5803&longitude=123.2135&pointName=
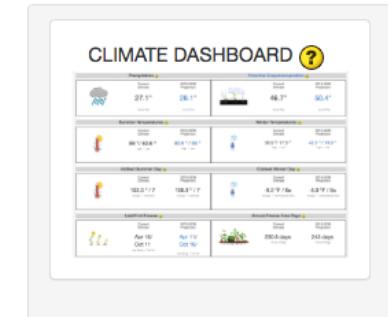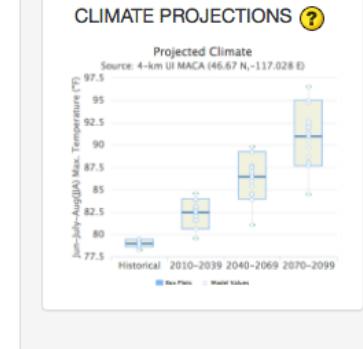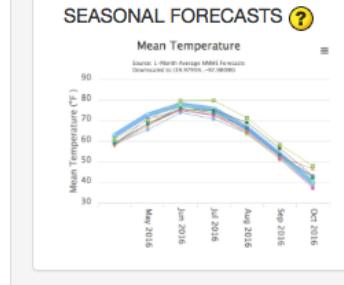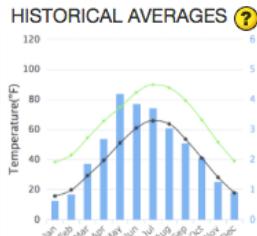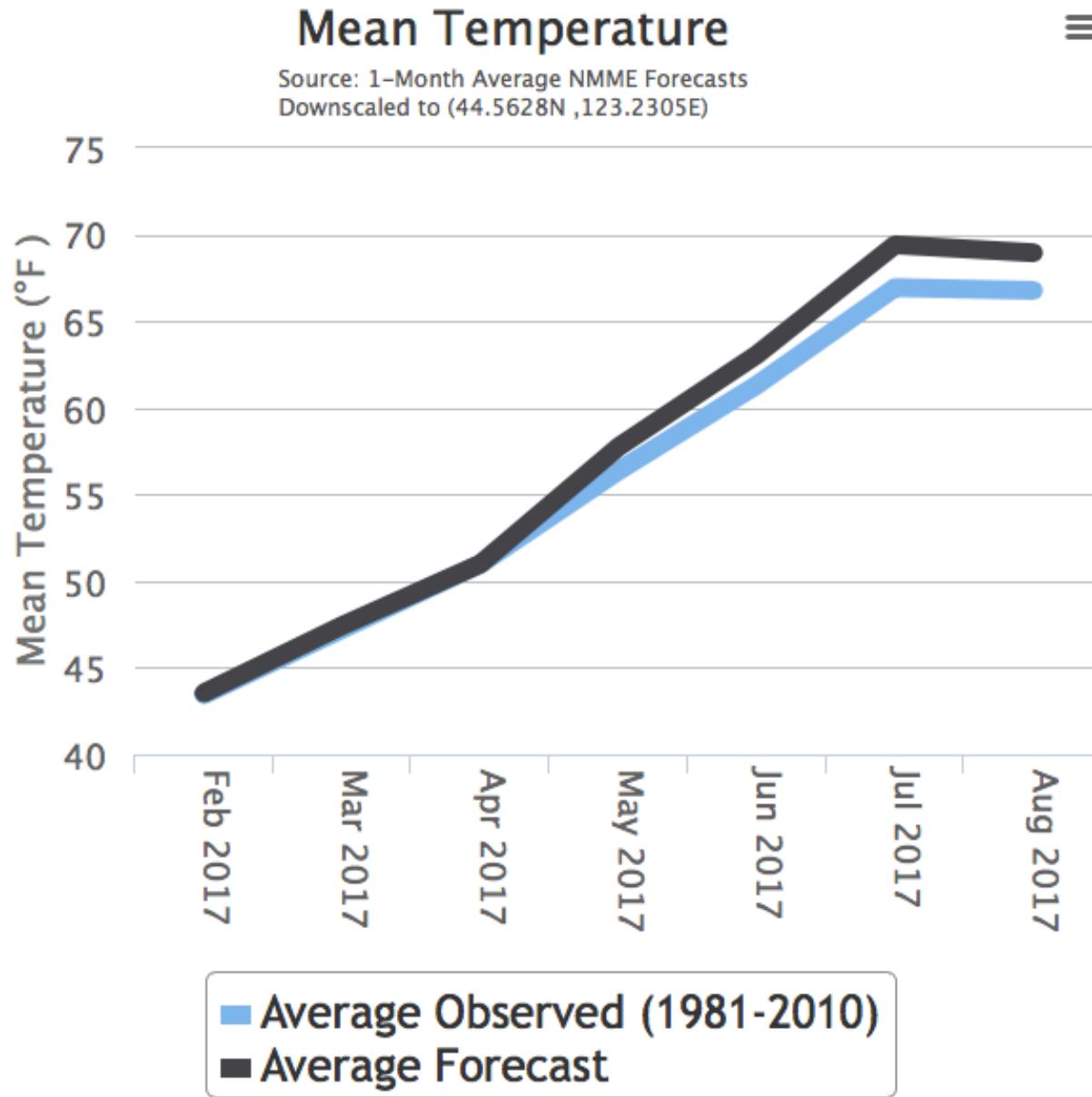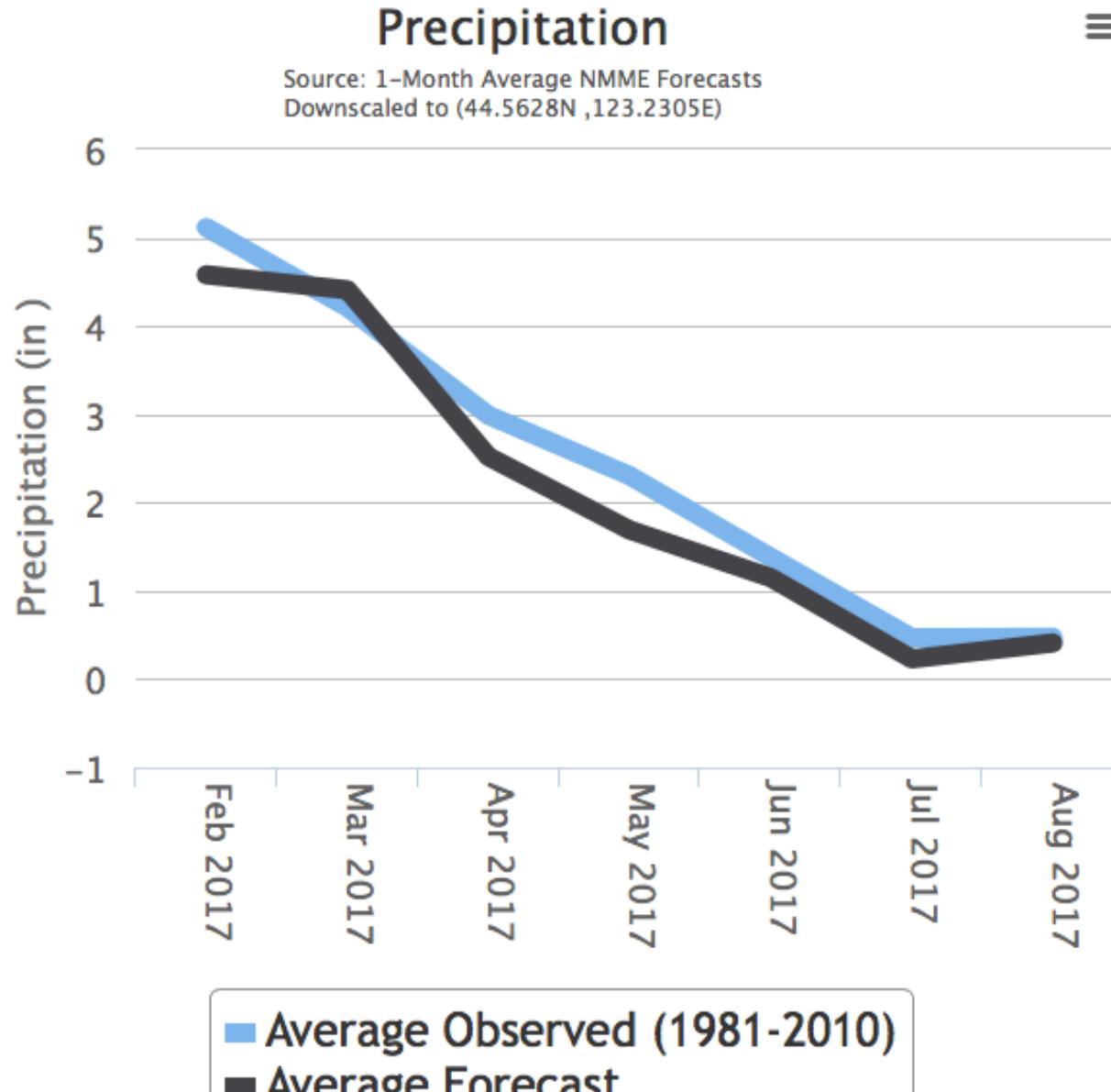
Farm-level Data is "King" in *AgBiz Logic*

o Cost and return (enterprise) budgets are the foundation of *ABL*
o 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

Data Collection – Schedule F

AgBiz Logic™   IAMTESTIN

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)

Data is Always in Season.™

Data Collection – Schedule F

Enter information from your Schedule F (Form 1040)

Step 2 of 4

Next, enter data from: **Part I: Farm Income - Cash Method.**

Line 1a. Sales of livestock and other resale items:

$ [   ] .00

Line 1b. Cost or other basis of livestock or other items:

$ [   ] .00

Line 1c. Subtract line 1b from line 1a:

$ [   ] .00

Line 2. Sales of livestock, produce, grains and other products you raised:

$ [   ] .00

Line 3a. Cooperative distributions (1099-PATR):

$ [   ] .00

Line 3b. Taxable amount:

$ [   ] .00

Line 4a. Agricultural program payments:

$ [   ] .00

Line 4b. Taxable amount:

$ [   ] .00

Data is Always in Season.™

Data Collection – Schedule F

Summary of information entered from Schedule F (Form 1040)

Step 4 of 4

Review the data you entered and confirm **Net Profit or Loss** in *AgBiz Logic* matches your Schedule F form. If you need to m:
Back button.

Gross Income: $ 4,224,000 .00

Total Expenses: $ 2,072,000 .00

Net Profit or Loss: $ 2,152,000 .00

Income

Line Category	Amount
Line 1a. Sales of livestock and other resale items:	$350,000
Line 1b. Cost or other basis of livestock or other items:	$50,000
Line 1c. Subtract line 1b from line 1a:	$300,000
Line 2. Sales of livestock, produce, grains and other products you raised:	$3,500,000
Line 3a. Cooperative distributions (1099-PATR):	$3,000
Line 3b. Taxable amount:	$1,500
Line 4a. Agricultural program payments:	$60,000
Line 4b. Taxable amount:	$60,000
Line 5a. Commodity Credit Corporation (CCC) loans reported under election:	$0

AgBiz Logic™

Transfer your business data to *AgBiz Logic*

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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)

Data Collection – Import from Accounting System

AgBiz Logic™ Alpha 1.0 (pre-release)   YogiBerra

Convert your accounting data to *AgBiz Logic*

Drag income & expense items highlighted in green on the left to the *AgBiz Logic* standardized categories on the right, as demonstrated here.

Note: Negative values convert to positive, per standard accounting practices.

Mayberry Farms 2015 Expenses by Category

Category	Total for Category
L-T asset replacement and section 179	$250,000.00
Veterinary, breeding, ...	$40,000.00
Utilities	$40,000.00
Supplies	$10,000.00
Storage and warehousing	$25,000.00
Seeds and plants	$60,000.00
Sales of livestock to be resold	$350,000.00
Sales of grains and oil crops	$3,500,000.00
Repairs and maintenance	$30,000.00
Rent or lease: (land, animals, etc.)	$150,000.00
Property taxes	$9,000.00
Pension and profit-sharing plans	$15,000.00
Other income	$12,500.00
Other expenses: Other miscellaneous	$50,000.00
Other expenses: miscellaneous	$10,000.00
Mach, equip, vehicle: rent or lease	$52,000.00
Labor hired (less employment)	$200,000.00
Interest on loans and mortagages	$350,000.00
Insurance (other than health)	$50,000.00
Gasoline, fuel and oil	$100,000.00
Freight and trucking	$28,000.00
Fertilizers and lime	$75,000.00
Feed	$13,000.00
Employee benefit programs	$300,000.00
Custom hire (machine work) income	$150,000.00
Custom hire (machine work)	$20,000.00
Crop insurance proceeds	$200,000.00
Cost of goods sold	$50,000.00
Cooperative distributions	$1,500.00
Conservation expenses	$25,000.00
Chemicals	$160,000.00

Select an *AgBiz Logic* Income/Expense Category:

✓ Select your option
Income
  Sales of livestock, produce, grains and other products
  Cooperative distributions received
  Agricultural program payments
  Commodity Credit Corporation
  Crop insurance proceeds & federal crop disaster payments
  Specified custom hire (machine work) income
  Other income
Expenses
  Cost of goods sold
  Car and truck expenses
  Chemicals
  Conservation expenses
  Custom hire (machine work)
  L-T asset replacement and section 179 expense
  Employee benefit programs
  Feed
  Fertilizers and lime
  Freight and trucking
  Gasoline, fuel, and oil
  Insurance (other than health)
  Interest on loans and mortgages
  Labor hired (less employment credits)
  Pension and profit-sharing plans
  Machinery, equipment or vehicle rent or lease
  Land and animal rent or lease
  Repairs and maintenance
  Seeds and plants
  Storage and warehousing
  Supplies
  Property taxes
  Utilities
  Veterinary, breeding, and medicine
  Other expenses

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Business Allocation

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	%

Data is Always in Season.™

Business Allocation

Summary

Here is a summary of your allocated business income and expenses.

Income | Expenses

Category	Crop	Livestock	Whole Farm
Sales of livestock, produce, grains and other products	$20	$20	$20
Cooperative distributions received	$15	$15	$15
Agricultural program payments	$15	$15	$15
Crop insurance proceeds and federal crop disaster payments	$15	$15	$15
Specified custom hire (machine work) income	$10	$10	$10
Other income	$10	$10	$10
Total	$85	$85	$85

Summary

Here is a summary of your allocated business income and expenses.

Income | **Expenses**

Category	Crop	Livestock	Whole Farm
Cost of goods sold	$0	$50,000	$0
Car and truck expenses	$9,200	$800	$0
Chemicals	$160,000	$0	$0
Conservation expenses	$25,000	$0	$0
Custom hire (machine work)	$20,000	$0	$0
L-T asset replacement and section 179 expense	$187,500	$62,500	$0
Employee benefit programs	$270,000	$15,000	$15,000
Feed	$0	$13,000	$0
Fertilizers and lime	$73,500	$1,500	$0
Freight and trucking	$20,000	$8,000	$0
Gasoline, fuel and oil	$75,000	$15,000	$10,000
Insurance (other than health)	$40,000	$0	$10,000

Enterprise Allocation

Enterprise Allocation

AgBiz Logic™

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
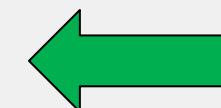
Select an Enterprise	Crop
Enterprise Type	Nut Crops
Commodity	Hazelnuts
Market	✓ –Select–
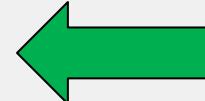
- –Select–
- Conventional
- GMO
- Local
- Natural
- Organic
- Other

Your enterprises so far:

Enterprise	Enterprise Type	Production/Commodity Type	Class

Back

Enterprise Budget for Hazelnuts, can be at the block level!

AgBiz Logic™   AgBizClimate   AgBizProfit   AgBizLease   AgBizFinance   AgBizEnvironment

Hazelnuts, Double-Density, Full Production

Please fill out the following information about this budget

Budget Name:
Hazelnuts, Double-Density, Full Production

State: Oregon

County: Willamette Valley

Budget Unit: 1   Acre

Length of Time for this Budget: Year

Time Periods for this Budget: 1

Notes:
This enterprise budget estimates the typical per-acre costs associated with establishing and producing Hazelnuts in the Willamette Valley of Oregon. It should be used as a guide to estimate actual costs and returns and is not representative of any particular farm. Source: http://arec.oregonstate.edu/oaeb/files/pdf/AEB0043.pdf AEB 0043, November 2013. (copy of Hazelnuts, Double-Density, Full Production)

Gross Return	Unit Sold by/as	Quantity Sold	Price per Unit Sold	Total Value	
Hazelnuts	Pound	2,800.00	$1.00	$2,800.00	Edit
Total Gross Returns				$2,800.00	

Add New

General Cash Costs

Name	Unit	Quantity	Price per Unit	Total Cost			
Chemicals	Acre	1	$40.48	$40.48	Edit	Add Variable Cost	
Depreciation and Section 179 Expenses	Acre	1	$319.90	$319.90	Edit		Add Fixed Cash Cost
Fertilizers and Lime	Acre	1	$262.36	$262.36	Edit	Add Variable Cost	
Gasoline, Fuel, and Oil	Acre	1	$96.34	$96.34	Edit	Add Variable Cost	
Insurance (other than health)	Acre	1	$50.35	$50.35	Edit	Add Variable Cost	Add Fixed Cash Cost
Interest on Loans and Mortgages	Acre	1	$14.07	$14.07	Edit	Add Variable Cost	Add Fixed Cash Cost
Labor Hired (less employment credits)	Acre	1	$103.46	$103.46	Edit	Add Variable Cost	
Other Expenses	Acre	1	$126.69	$126.69	Edit	Add Variable Cost	Add Fixed Cash Cost
Property Taxes	Acre	1	$5.00	$5.00	Edit		Add Fixed Cash Cost
Repairs and Maintenance	Acre	1	$78.82	$78.82	Edit	Add Variable Cost	
Utilities	Acre	1	$6.92	$6.92	Edit	Add Variable Cost	Add Fixed Cash Cost
Total General Costs				$1,104.39			

Add General Cost

Totals

Total Gross Returns	
Total Costs	
Net Returns (income minus costs)	

Detail Inputs and Costs from the General Format

General Cash Costs

Name	Unit	Quantity	Price per Unit	Total Cost		❓	❓
Chemicals	Acre	1	$40.48	$40.48	Edit	Add Variable Cost	
Depreciation and Section 179 Expenses	Acre	1	$319.90	$319.90	Edit		Add Fixed Cash Cost
Fertilizers and Lime	Acre	1	$262.36	$262.36	Edit	Add Variable Cost	
Gasoline, Fuel, and Oil	Acre	1	$96.34	$96.34	Edit	Add Variable Cost	
Insurance (other than health)	Acre	1	$50.35	$50.35	Edit	Add Variable Cost	Add Fixed Cash Cost
Interest on Loans and Mortgages	Acre	1	$14.07	$14.07	Edit	Add Variable Cost	Add Fixed Cash Cost
Labor Hired (less employment credits)	Acre	1	$103.46	$103.46	Edit	Add Variable Cost	
Other Expenses	Acre	1	$126.69	$126.69	Edit	Add Variable Cost	Add Fixed Cash Cost
Property Taxes	Acre	1	$5.00	$5.00	Edit		Add Fixed Cash Cost
Repairs and Maintenance	Acre	1	$78.82	$78.82	Edit	Add Variable Cost	
Utilities	Acre	1	$6.92	$6.92	Edit	Add Variable Cost	Add Fixed Cash Cost
Total General Costs				**$1,104.39**			

Add General Cost

Detail Inputs and Costs from the General Format

General Cash Costs

Name
Chemicals
Depreciation and Section 179 Expenses
Fertilizers and Lime
Gasoline, Fuel, and Oil
Insurance (other than health)
Interest on Loans and Mortgages
Labor Hired (less employment credits)
Other Expenses
Property Taxes
Repairs and Maintenance
Utilities
Total General Costs

Add Variable Cost item

Remaining amount for this sub-category: **$262.36**

Category:

Pre-Harvest

Sub-category:

Fertilizer

Name:

- ✓ Select
- Ammonium nitrate
- Ammonium sulfate
- Anhydrous ammonia
- Aqua ammonia
- Blend
- Cal-nitro
- Calcium nitrate
- Compost
- Compost teas
- Diammonium phosphate
- Elemental sulfur
- Foliar Mn
- Foliar N
- Foliar Zn
- Liquid manure
- Manure
- Monoammonium phosphate
- Nitrogen
- Other
- Phosphorus
- Potash
- Potassium chloride
- Potassium hydroxide
- Potassium nitrate
- Potassium sulfate
- Sulfate of potash magnesia
- Triple superphosphate
- UAN32
- UN32
- Urea
- Zinc sulfate foliar

Detail Inputs and Costs from the General Format

General Cash Costs

Name				
Chemicals				
Depreciation and Section 179 Expenses				
Fertilizers and Lime				
Gasoline, Fuel, and Oil				
Insurance (other than health)				
Interest on Loans and Mortgages				
Labor Hired (less employment credits)				
Other Expenses				
Property Taxes				
Repairs and Maintenance	Acre	1	$78.82	$78.82	Edit	Add Variable Cost
Utilities	Acre	1	$6.92	$6.92	Edit	Add Variable Cost
Total General Costs				$1,104.39

Add Variable Cost item

Remaining amount for this sub-category: **$260.61**

Category:

Pre-Harvest

Sub-category:

Fertilizer

Name:

Potash

Unit: | Quantity:

Pound		7	Pound

Price per Unit: | Total Cost:

$	0.25	$	1.75

Cancel   Save

Data is Always in Season.™

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Detail Inputs and Costs from the General Format

Variable Costs

Parent Category	Category	Sub-Category	Name	Unit	Quantity	Price per Unit	Total Cost		
Fertilizers and Lime	Pre-Harvest	Fertilizer	Potash	Acre	1	$0.25	$1.75	Edit	Remove
Total Variable Costs							**$1.75**		

Totals

Total Gross Returns	$2,800.00
Total Costs	$1,104.39
Net Returns (income minus costs)	$1,695.61

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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)