



Agricultural Leadership Program

BUILDING LEADERSHIP IN WASHINGTON'S AGRICULTURE



Washington
State Department of
Agriculture



Basic economics



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Learning objectives



- Help understand the importance of labor to the bottom-line
- Strategies to achieve the economic expectations
- Case studies

Importance of the orchard supervisor

- The orchard supervisor is key to the success of the business
 - Combining leadership skills, guarantee the support of the orchard owners and communicate to the workers

Understand the economic goals of the business

Maximize Profit

$$\text{Profit} = \text{Total Revenue} - \text{Total Cost}$$

Understanding Profits

- Profits are not always > 0
 - Yield and price variability
- Short term economic situation
 - Variable costs and cash costs
- Long term economic situation
 - Cash and non-cash costs

**What is the
difference between
short run and long
run?**

Total Revenue

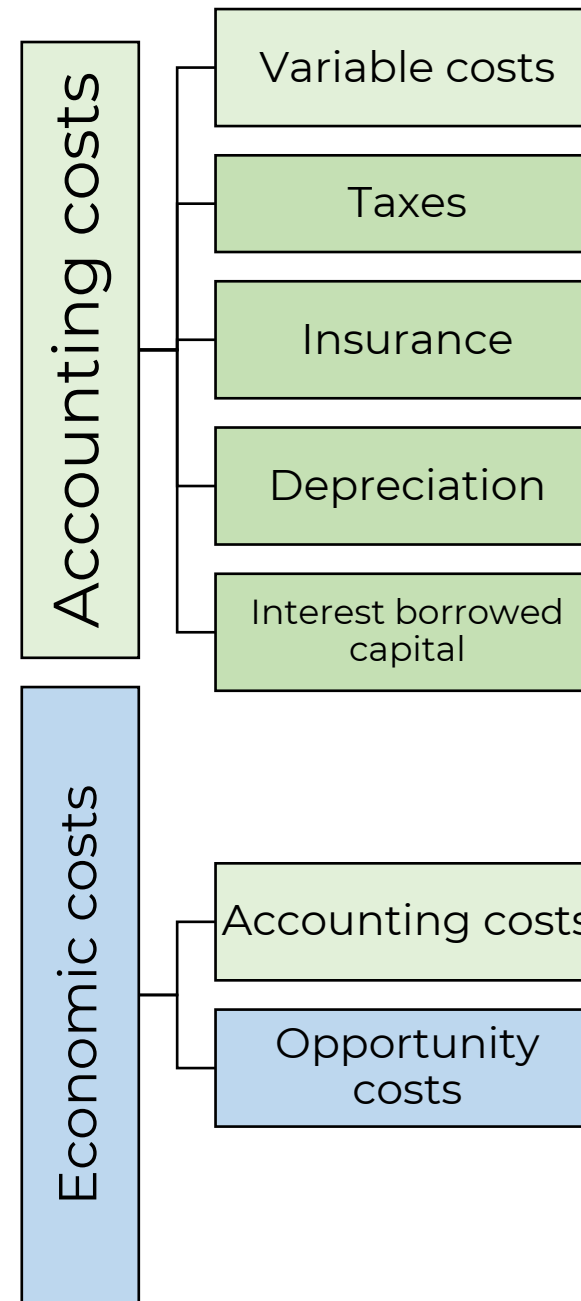
- Yield times Price per unit
- How to increase revenues:
 - Strategy 1: Increase the production volume
 - Strategy 2: Increase the per unit – quality related
 - Strategy 3: Balance between production volume and prices to guarantee a profit margin

Total costs

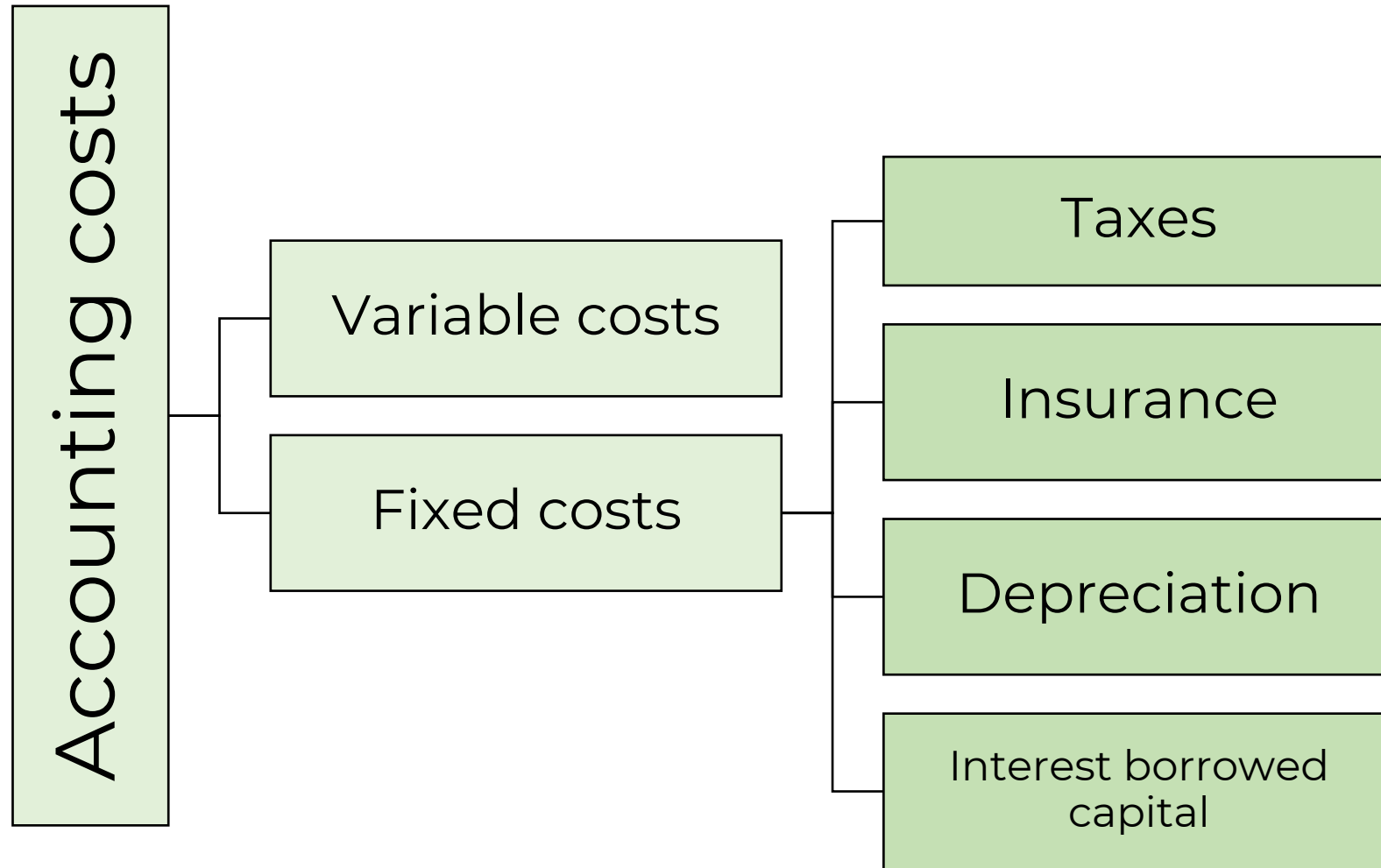
Two types:

- Accounting costs
- Economic costs

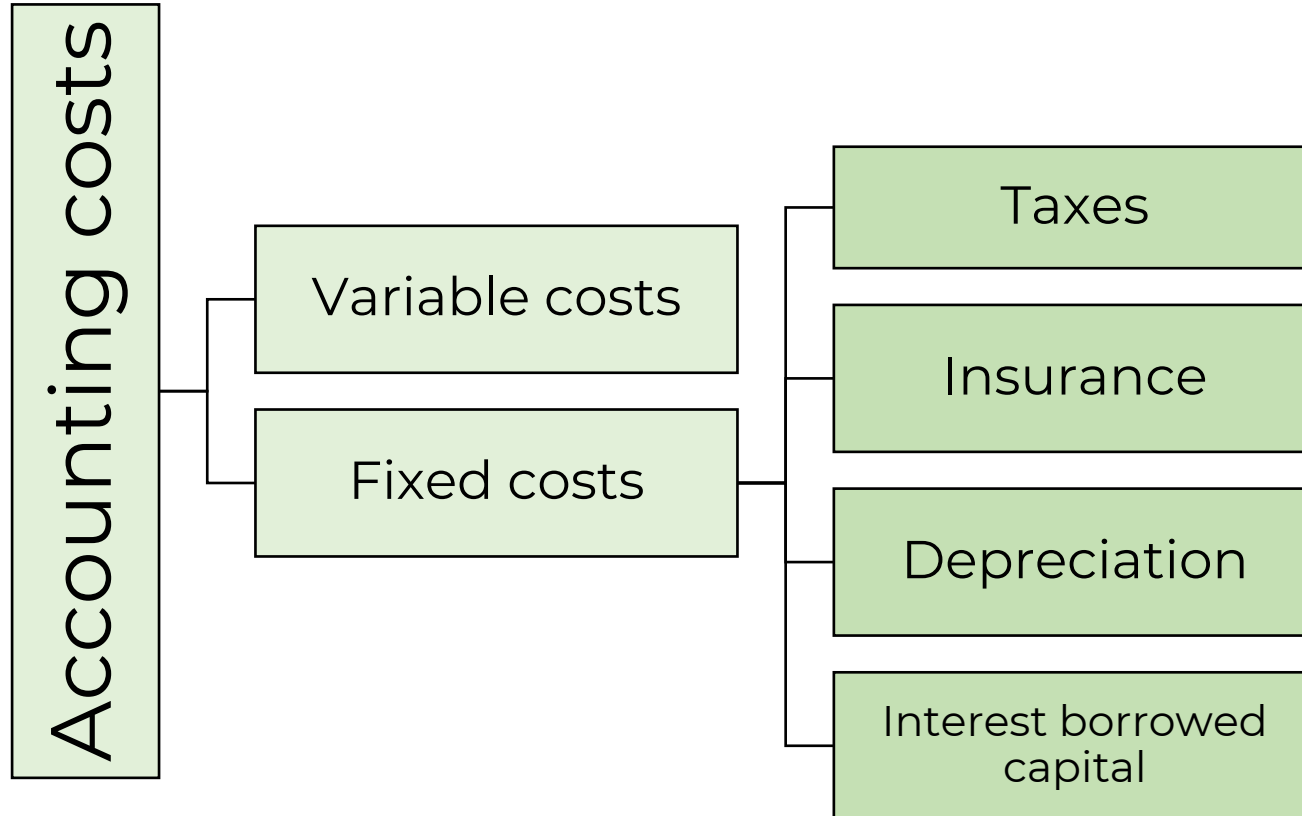
Which one is larger?



Variable and fixed costs



Fixed costs



- Fixed costs do not change as the level of production changes in the short run
- Costs incurred even if the input is not used
- Depreciation, insurance, taxes, and interest
- Only exist in the short run

Example: Fixed cost self propelled harvester

Purchase value: \$120,000

Salvage value: \$40,000

Useful life: 10 years

Annual property taxes: \$400

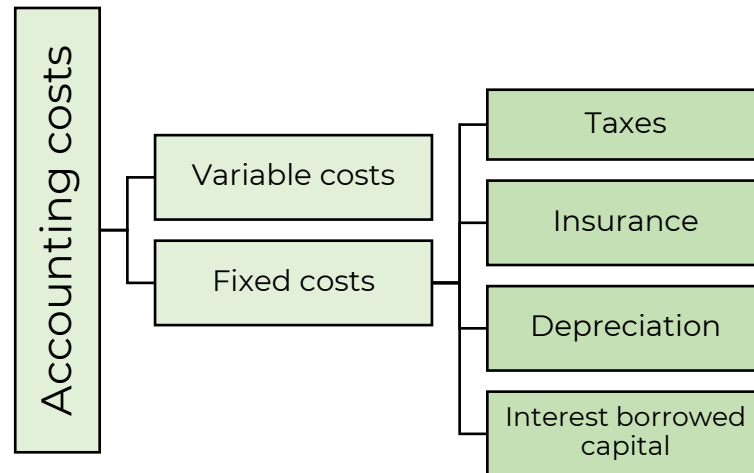
Annual insurance: \$500

Cost of capital: 6%

Cost center	Formula	Numbers	Value
Average value	$\frac{\text{Purchase} + \text{Salvage}}{2}$	$\frac{120,000 + 40,000}{2}$	\$ 80,000
Interest	Average value × 6%	80,000 × 6%	\$ 4,800
Depreciation	$\frac{\text{Purchase} - \text{Salvage}}{\text{Useful life}}$	$\frac{120,000 - 40,000}{10}$	\$ 8,000
Taxes			\$ 400
Insurance			\$ 500
Annual total fixed cost			\$ 13,700

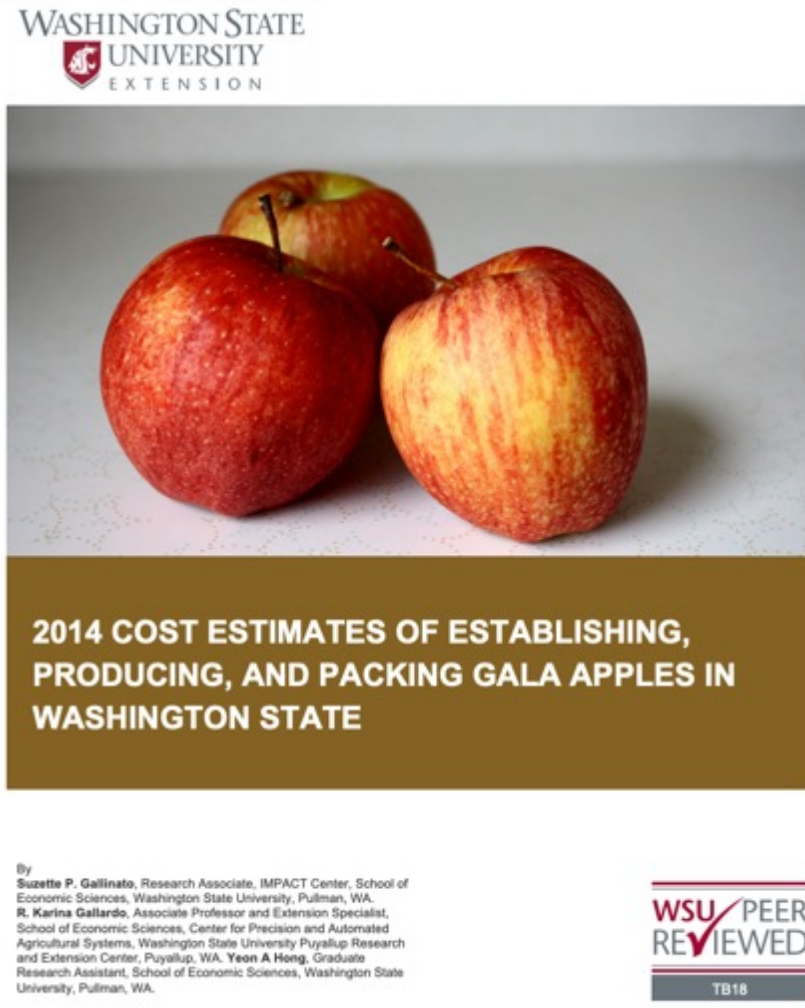
Variable costs

- Depend on the level of input used
- Manager has control over them
- Exist both on the long and short run



Soil preparation
Planting
Run irrigation
Fertilization
Plant protection
Winter pruning
Summer pruning
Fruit thinning
Weed management
Harvest
Packing costs

Enterprise Budgets



- Purpose: Estimate the projected costs, returns, and profit per unit for the enterprises.
- Uses:
 - To identify the more profitable enterprises to be included in the whole-farm plan
 - Once completed it is a source of data for other types of budgeting
 - Will be used for data when making many types of decisions

How to find WSU Apple Enterprise Budgets

← → ↻ google.com/search?q=WSU+Crop+enterprise+budgets&oq=WSU+crop+enterprise+budgets&aqs=chrome.0.69i59j69i60.913

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The purposes of these **budgets** are to estimate the costs and returns from producing these **crops** for research and policy purposes and to provide producers and their credit providers with a tool to use in **enterprise** selection and financing.
You've visited this page many times. Last visit: 12/8/19

Crop Enterprise Budgets | Washington State University - WSU ...
[ses.wsu.edu > agriculture-international-marketing](#) ▼
Washington **Enterprise Budgets** for **Crop** Commodities ... Alfalfa, 1996 Alfalfa Seed **Enterprise Budget**, Walla Walla County, Washington (EB1375), Gary, Willett ...

www.ses.wsu.edu/enterprise_budgets



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Crop Enterprise Budgets

Washington State University has a history of developing and publishing enterprise budgets for many of the major crops grown throughout Washington State. The purposes of these budgets are to estimate the costs and returns from producing these crops for research and policy purposes and to provide producers and their credit providers with a tool to use in enterprise selection and financing.

Washington Enterprise Budgets for Crop Commodities

Search:

Commodity	Title	Author	Date	Link
Alfalfa	2012 Irrigated Alfalfa Hay Budget Under Center Pivot in the Columbia Basin (FS133E)	Norberg, Neibergs	2014	pdf excel
Alfalfa	Organic Alfalfa Management Guide (Feb 2009) (EB2039E)	Fuerst, Koenig, Kugler, Painter, Stannard, Goldberger	2009	pdf
Alfalfa	Spreadsheet for Dryland Organic Alfalfa Production	Painter	2009	pdf excel
Alfalfa	2009 Costs of Producing Alfalfa Hay	Hinman,	2009	pdf


Financial Analysis & Record Keeping

Careful record keeping and some basic financial analysis can take some of the guesswork and stress out of being a business manager:





- Motivation – Why get excited about financial analysis?
- Analyzing your farm's financial performance – Cash flow statements
- Investment analysis – Different evaluation methods
- Amortization of loans – Making them cash flow

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Washington Enterprise Budgets for Crop Commodities

Commodity	Title	Author	Date	Link
Apples	2015 Cost Estimates of Establishing and Producing Specialty Cider Apples in	Galinato, Miles	2017	pdf excel
Apples	Feasibility of Different Harvest Methods for Cider Apples: Case Study for Western Washington (TB32)	Galinato, Miles, Alexander	2016	pdf
Apples	TB32 Appendix A. Hand Harvested Cider Apples (spreadsheet)	Galinato, Miles, Alexander	2016	excel
Apples	TB32 Appendix B. Mechanically Harvested Cider Apples (spreadsheet)	Galinato, Miles, Alexander	2016	excel

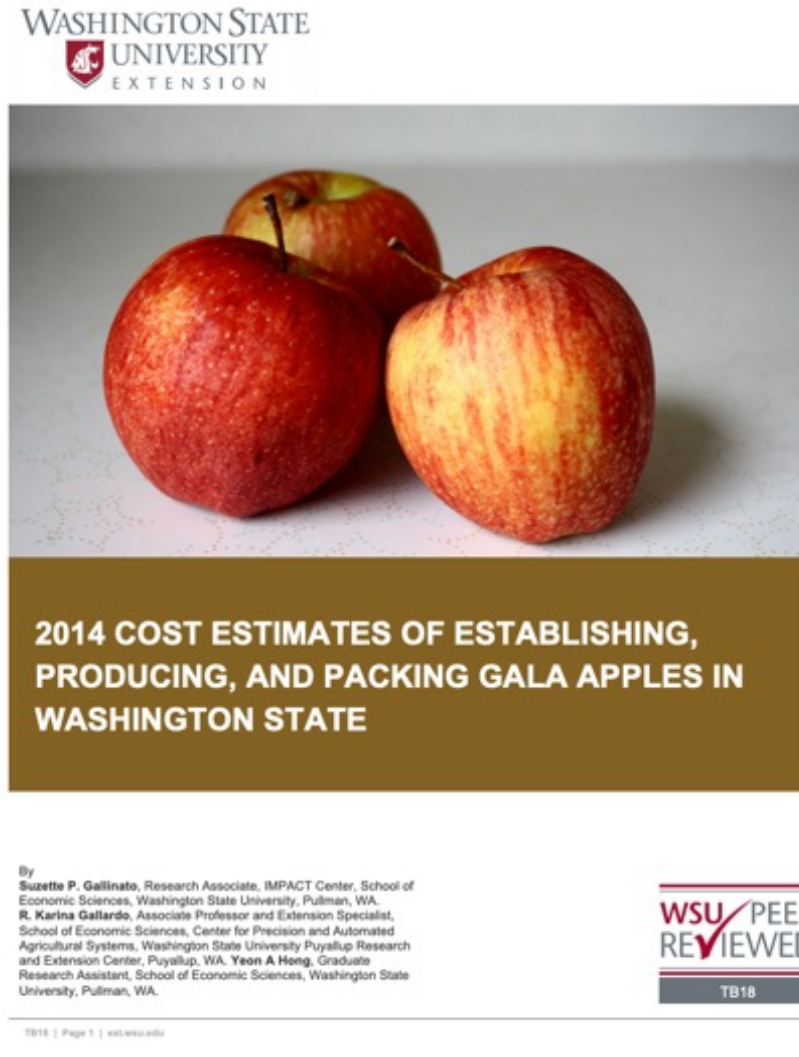
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WSU enterprise budgets – PDF & Excel





2019 WSU Apple Enterprise Budgets

By
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Research Assistant, School of Economic Sciences, Washington State
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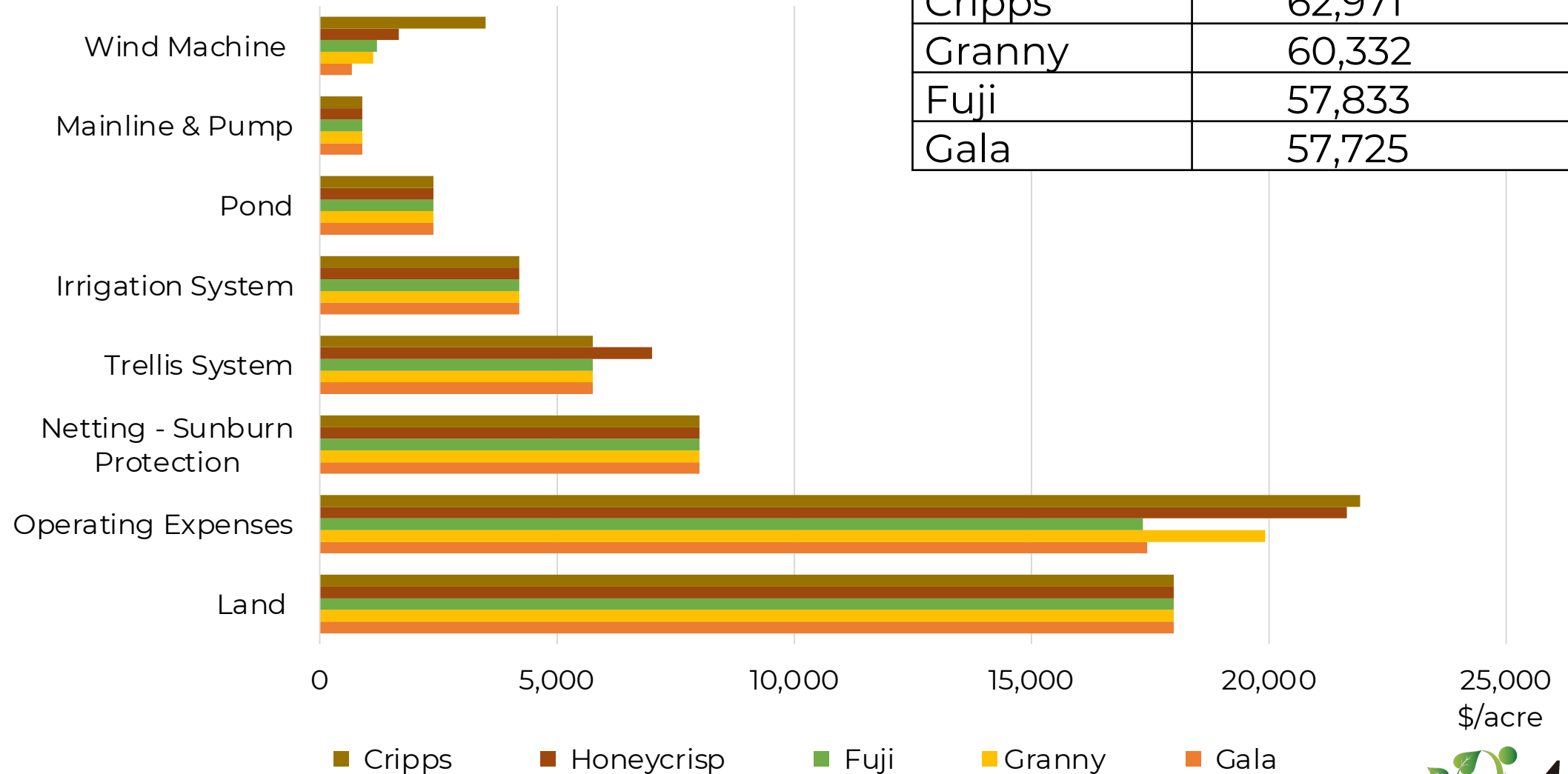
2019 Updates

- 🍏 Gala
- 🍏 Granny Smith
- 🍏 Fuji
- 🍏 Honeycrisp
- 🍏 Cripps Pink

Assumptions

	Gala	Granny Smith	Fuji	Honeycrisp	Cripps Pink
Farm size (acre)	300	300	300	300	300
Productive block size (acre)	52	31	29	21	10
Gross yield full production (bin/acre)	85	85	85	75	85
Packout (box/bin)	18.5	16.5	18.5	13	18
FOB price (\$/40-lb box)	26	24	27	57	31
In-row spacing (feet)	4	3	4	3	3
Bet. row spacing (feet)	10	10	10	10	10
Root stock	M9	M9	M9	M9	M9
Life of planting (years)	20	20	20	15	20
Tree density (trees/acre)	1,089	1,452	1,089	1,452	1,452
Trellis system	Spindle trellis system				
Block architecture	Randomly trained w/18" radius from tree center				

Capital requirement

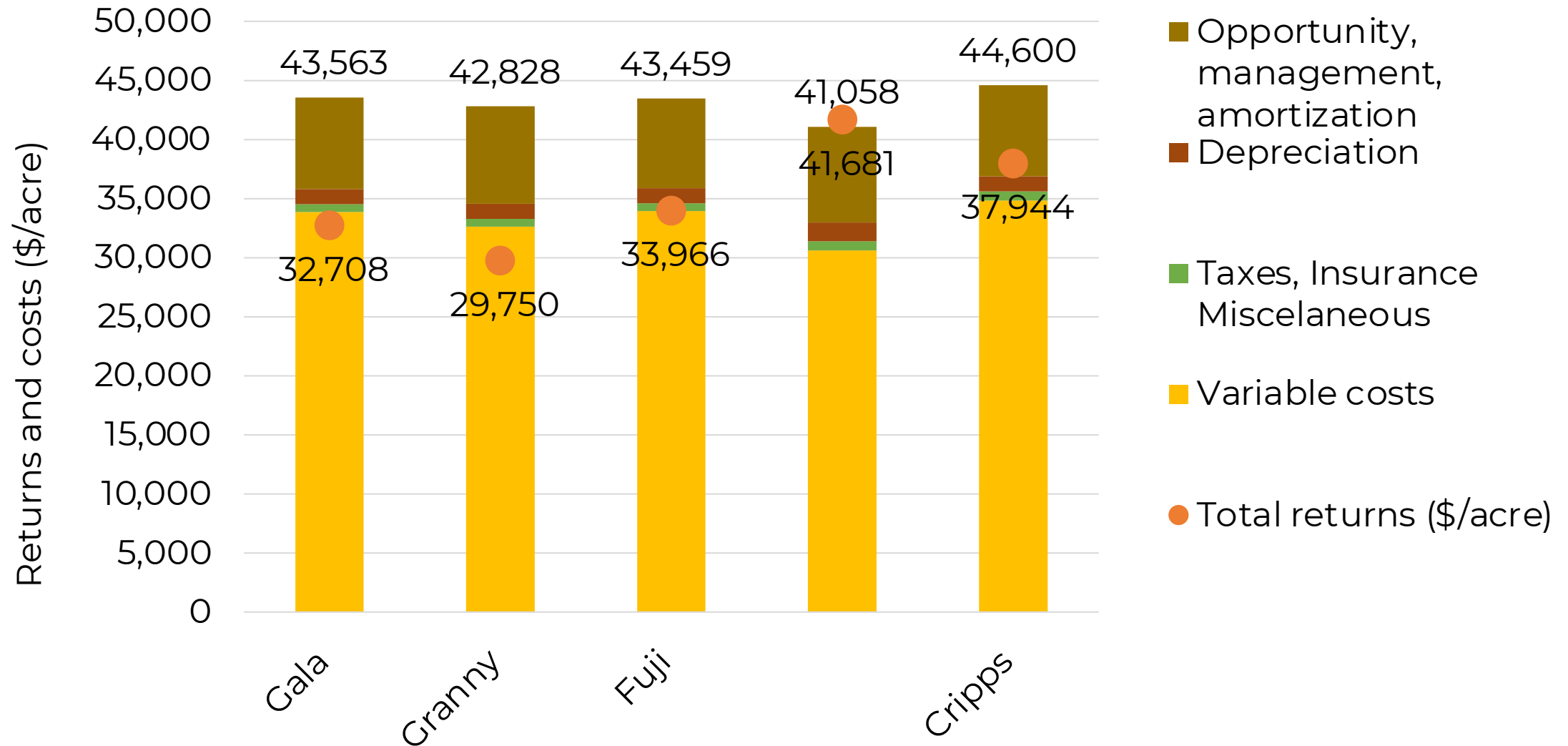


Apple variety	Capital requirement (\$/acre)
Honeycrisp	62,995
Cripps	62,971
Granny	60,332
Fuji	57,833
Gala	57,725

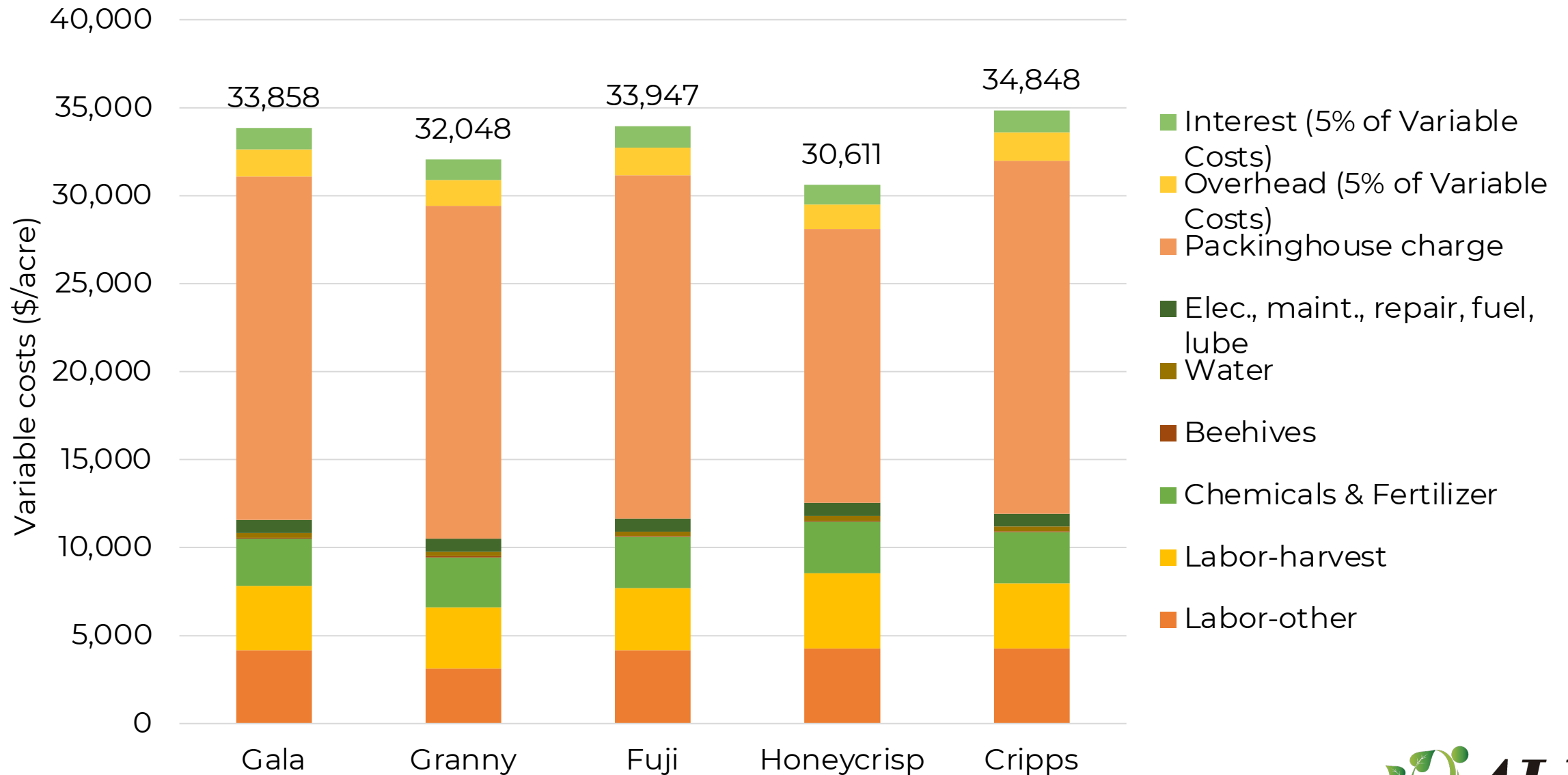
Assumption to calculate breakeven prices

	Gala	Granny	Fuji	Honeycrisp	Cripps
Net yield (bin/acre)	68	68	68	56.25	68
Packouts (box/bin)	18.5	17.5	18.5	13	18

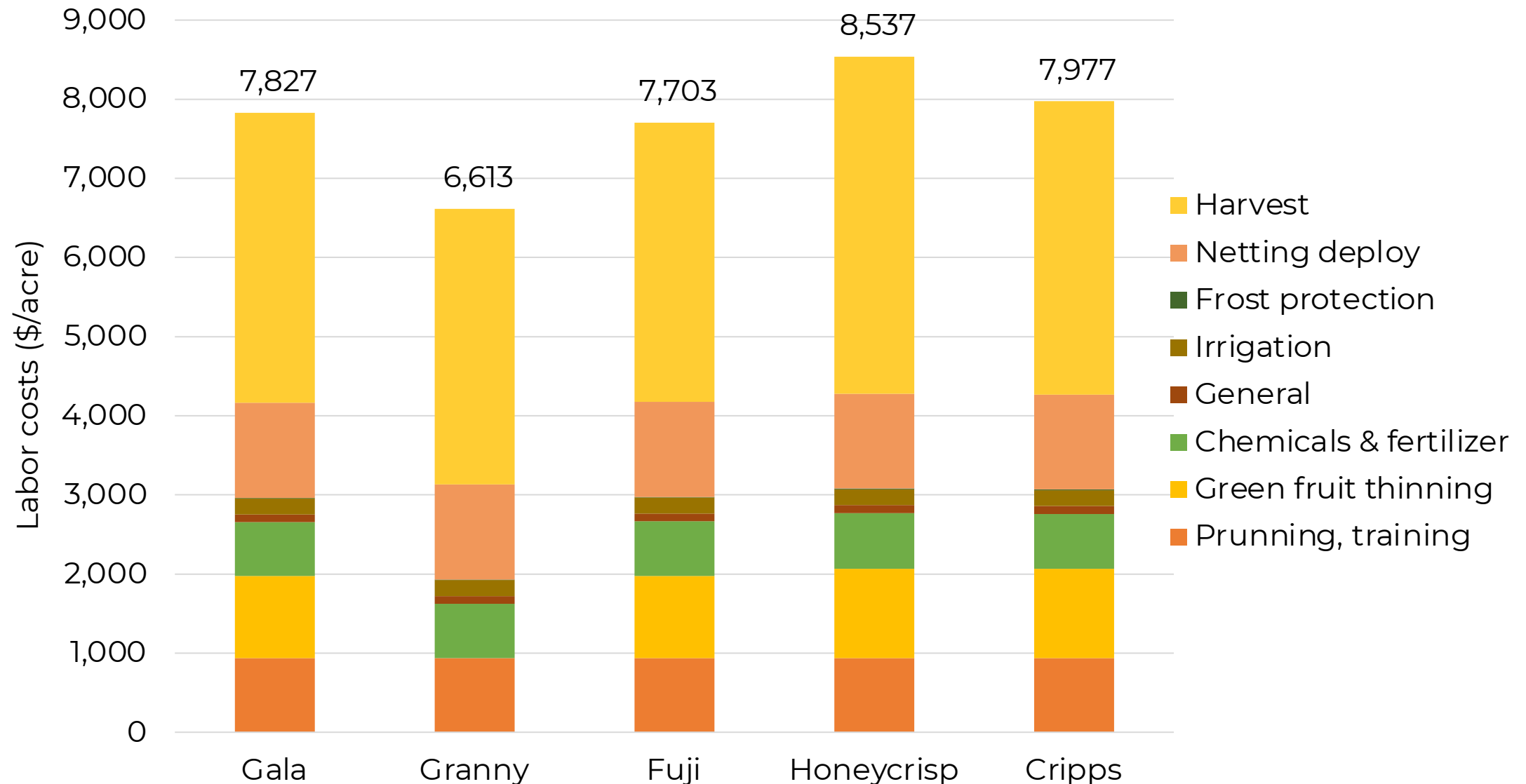
Full Production Year- Total returns and costs



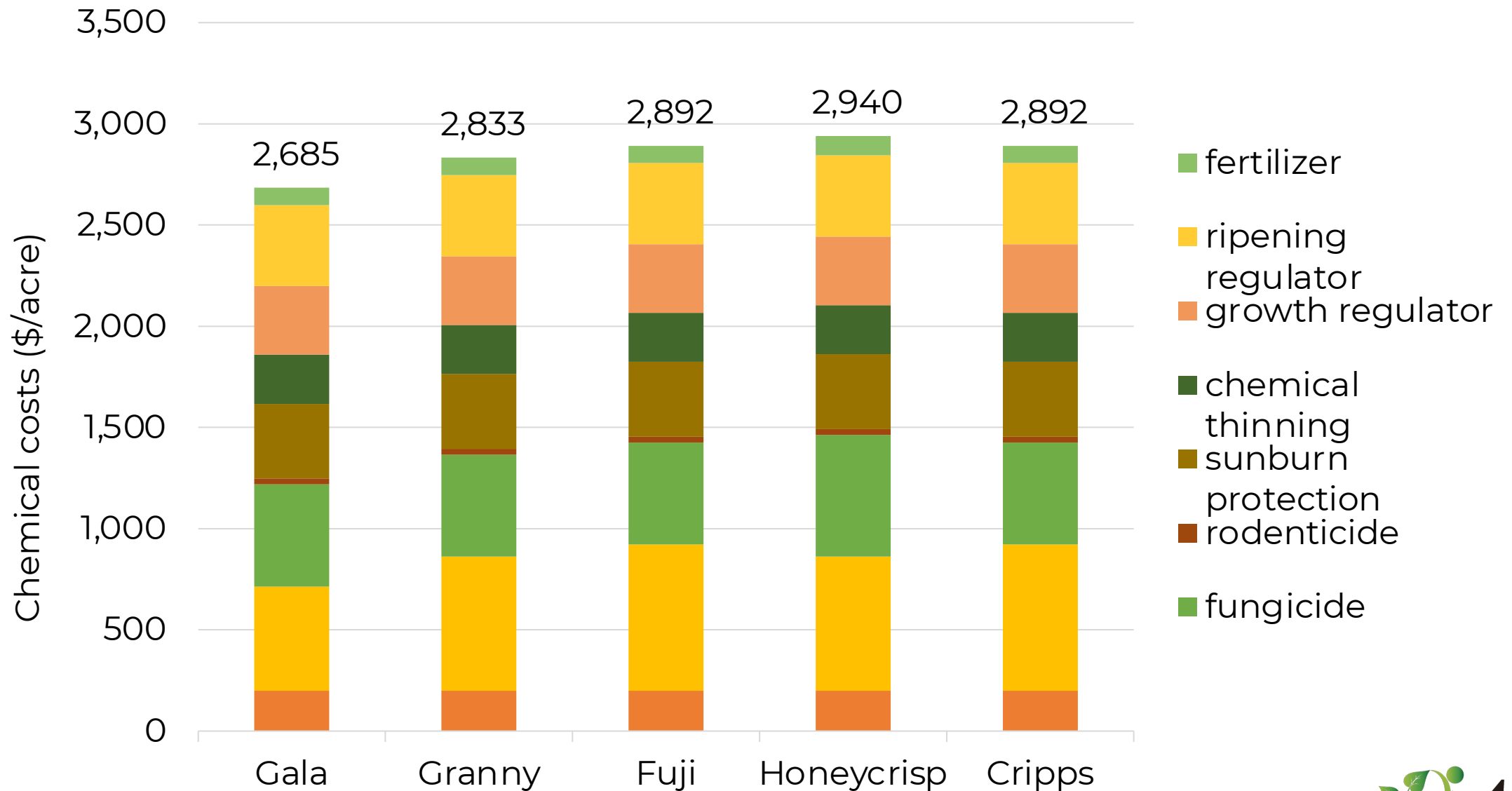
Variable costs – full production year



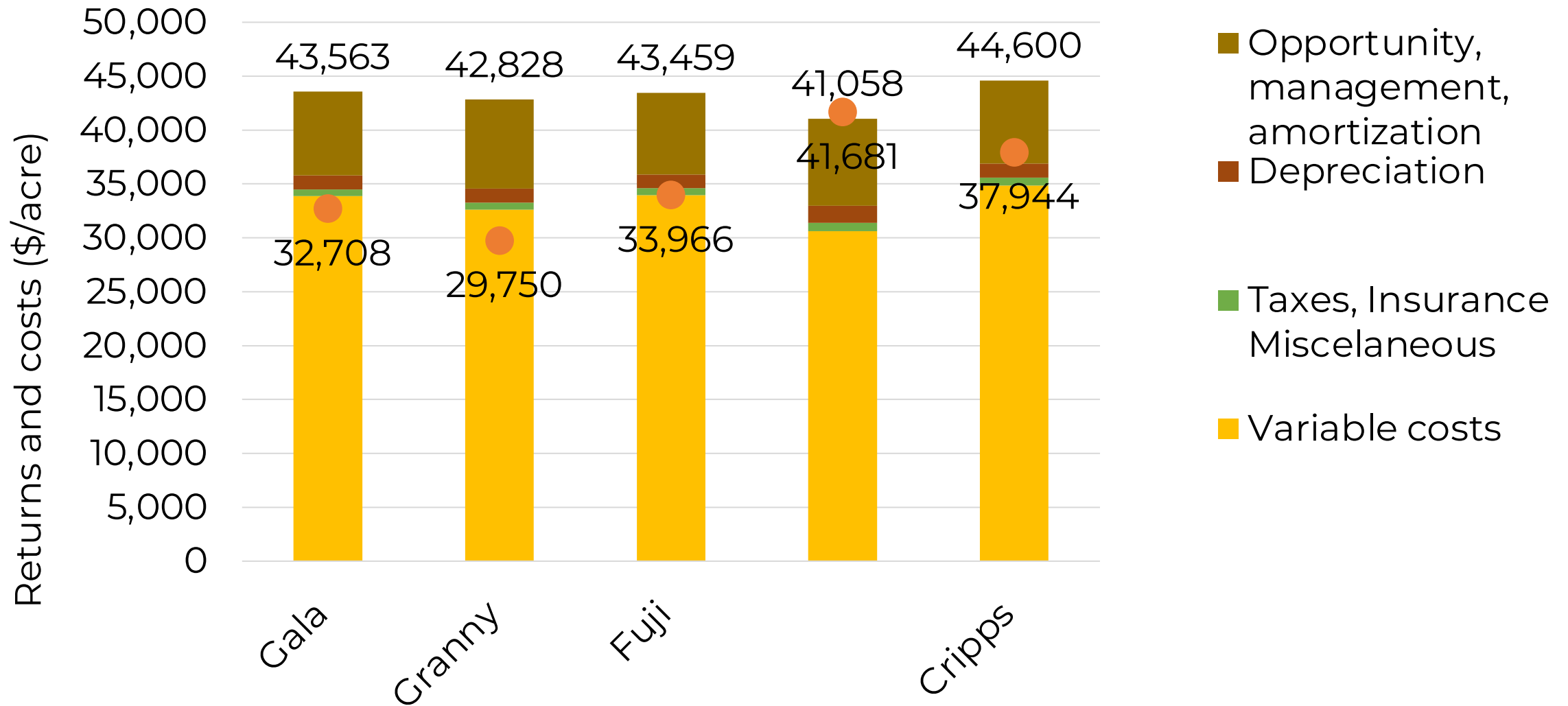
Labor costs – full production year



Chemical costs – full production year



Full Production Year- Total returns and costs



Interpreting and Analyzing Enterprise Budgets

- Economic profit vs. accounting profit
- Economic profit of zero.
- Break-even price
 - Output price needed to cover all costs at a given output level.
 - Break-even price = Total costs / expected yield

Break even returns \$/acre

Break-even price	Gala	Granny	Fuji	Honeycrisp	Cripps
	Breakeven returns (\$/acre)				
Total variable costs	33,858	32,048	33,947	30,611	34,848
Total cash (variable + taxes + insurance + miscellaneous)	34,503	32,693	34,592	31,381	35,588
Total cash + depreciation	35,752	33,974	35,881	32,973	36,872
Total cost (cash + depreciation + opportunity + management + amortization)	43,501	42,248	43,459	41,087	44,622

Assumption to calculate breakeven prices

	Gala	Granny	Fuji	Honeycrisp	Cripps
Net yield (bin/acre)	68	68	68	56.25	68
Packouts (box/bin)	18.5	17.5	18.5	13	18

Break even prices

Break-even price	Gala	Granny	Fuji	Honeycrisp	Cripps
	Breakeven price \$/40-lb box				
Total variable costs	26.91	26.93	26.99	41.86	28.47
Total cash (variable + taxes + insurance + miscellaneous)	27.43	27.47	27.50	42.91	29.07
Total cash + depreciation	28.44	28.55	28.52	45.09	30.12
Total cost (cash + depreciation+ opportunity + management + amortization)	34.63	35.50	34.55	56.19	36.46

Sensitivity analyses

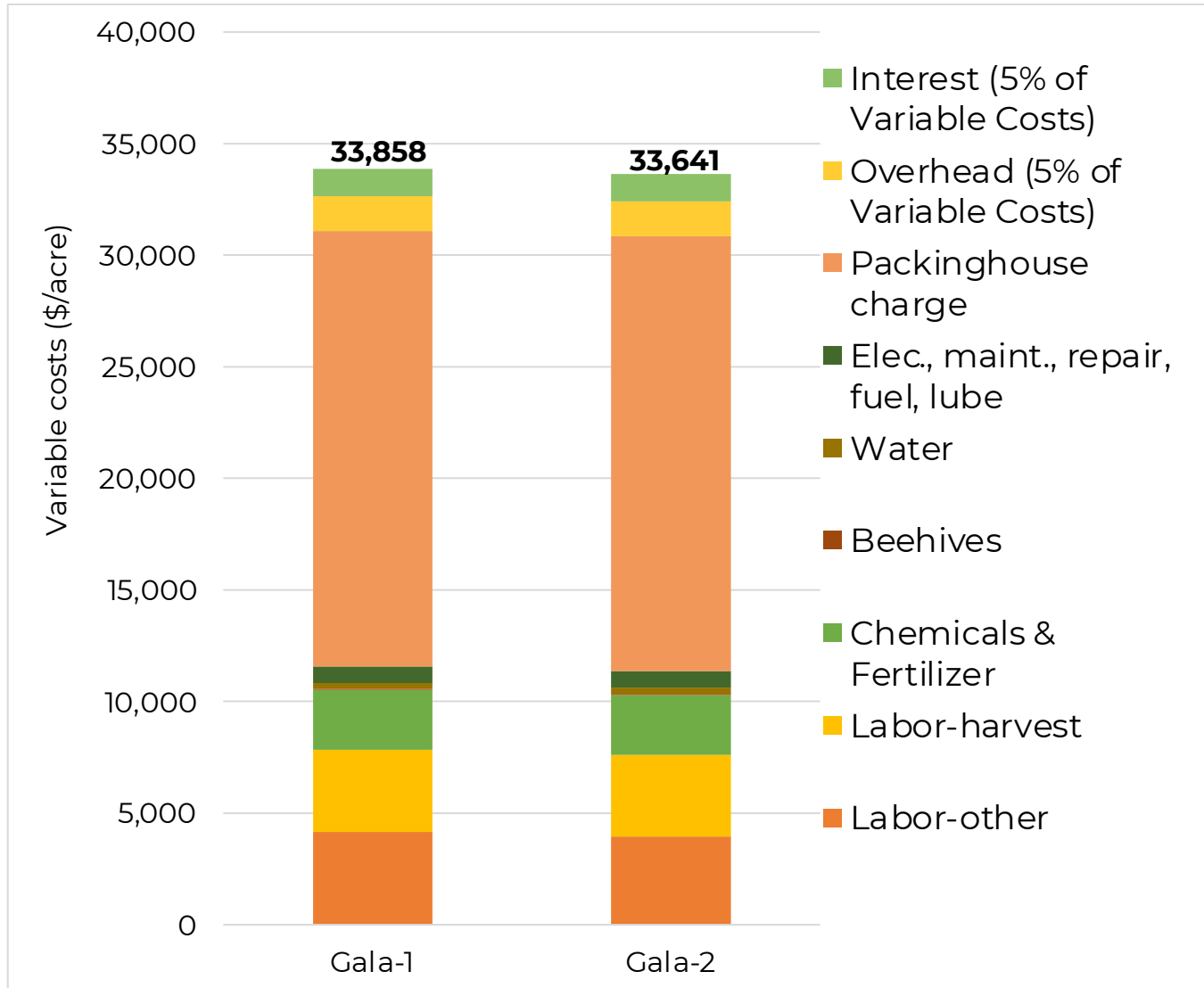
- Break even prices can be computed for a range of possible yield, different yields and different output prices result in different breakeven prices.

Estimated Net Returns at Various Prices and Yields of Honeycrisp during Full Production

Net Yield (bins/acre)	FOB Price (\$/bin)				
	\$591	\$641	\$691	\$741	\$791
48.75	-\$9,397	-\$6,959	-\$4,522	-\$2,084	\$353
52.5	-\$8,620	-\$5,995	-\$3,370	-\$745	\$1,880
56.25	-\$7,843	-\$5,031	-\$2,218	\$594	\$3,407
60	-\$7,067	-\$4,067	-\$1,067	\$1,933	\$4,933
63.75	-\$6,290	-\$3,102	\$85	\$3,273	\$6,460
Overhead cost	5%				
Interest cost	5%				

Understanding the relation of pruning costs and break-even prices

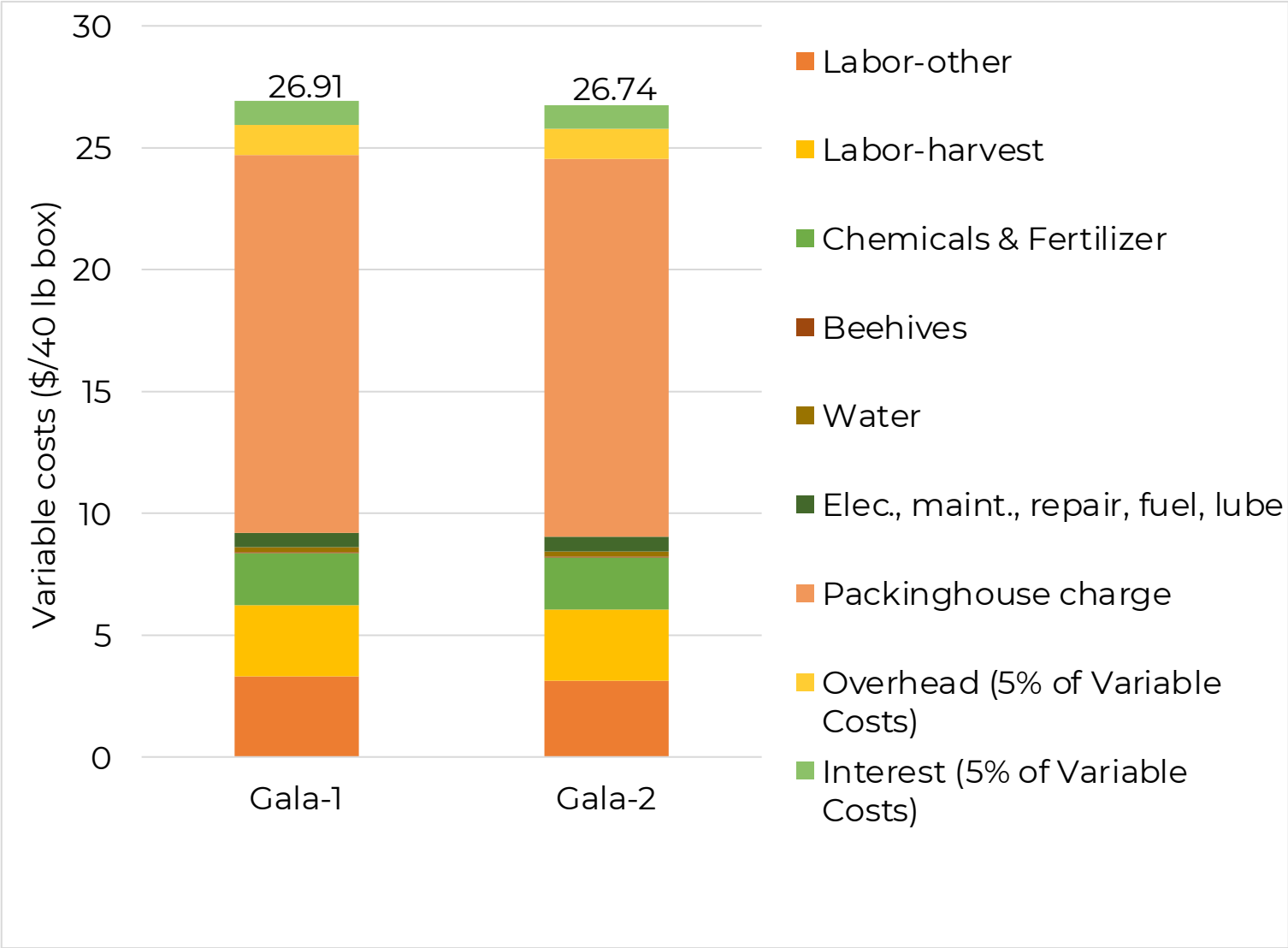
Labor costs- Full production [\$/acre]



	Wage (\$/hour)	Pruning costs (\$/acre)	Variable costs (\$/acre)
Gala 1	18.79	940	33,858
Gala 2	14.45	723	33,641

Assuming pruning takes 50 hours/acre

Labor cost-Full production year [\$ /40 lb box]

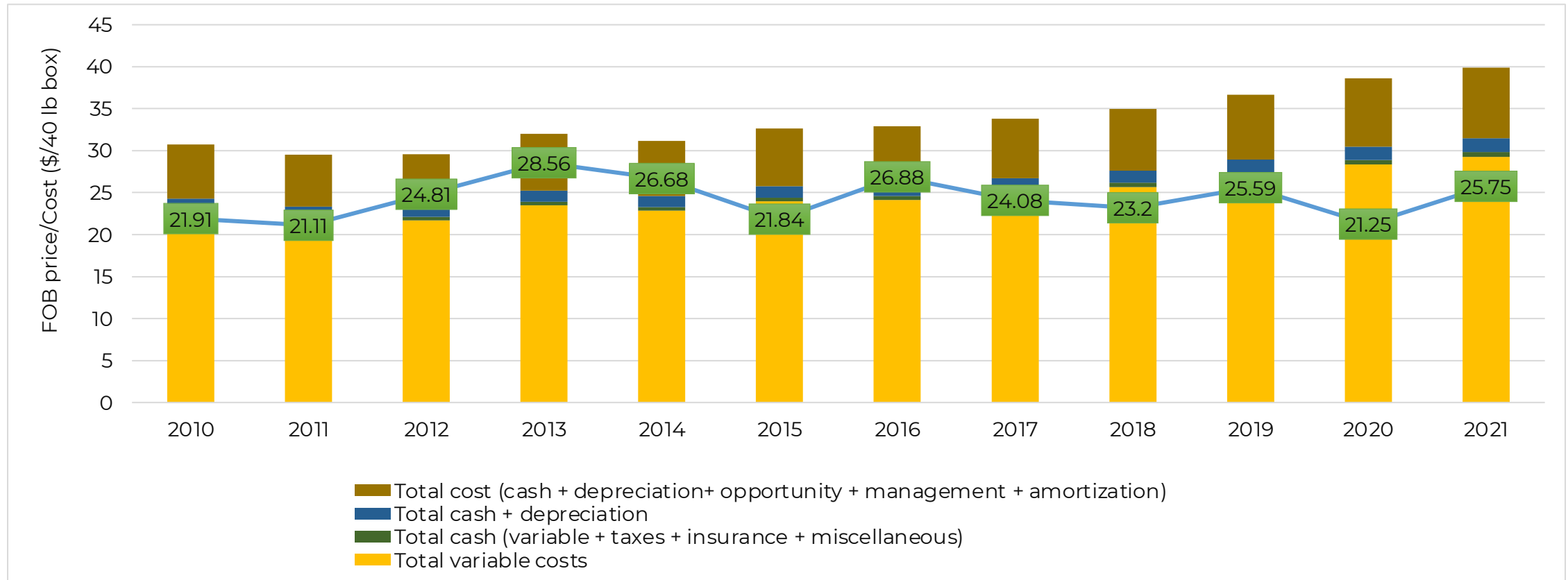


	Pruning costs (\$/acre)	Variable costs (\$/acre)	Wage (\$/hour)
Gala 1	18.79	3.31	26.91
Gala 2	14.45	3.14	26.74

The average for Gala in 2020-2021 was \$25.75/40 lb box

Assuming pruning takes 50 hours/acre

Times series: Variable costs – Gala FOB prices



H2A Wages

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
10.85	10.6	10.92	12	11.87	12.42	12.69	13.38	14.12	15.03	15.83	16.34	17.41

Case Study

Winter pruning

Winter pruning

 Excel spreadsheet

Summary



- Profits are not always > 0
 - Yield and price variability
- Short term vs long term
- Break even prices
- The importance of labor to the bottom-line
- Strategies to achieve the economic expectations

Resources



- Ronald Kay, William Edwards, and Patricia A. Duffy. 2020. Farm Management, 9th Ed. McGraw Hill. New York. NY.
- Washington State University. Crop Enterprise Budget.
http://ses.wsu.edu/enterprise_budgets/
- Washington State University. Tree Fruit Economics.
http://ses.wsu.edu/extension/tree_fruit_economics/

THANK YOU!



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