



Potential Costs and Returns for Growing Satsumas in North Florida

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Acknowledgements

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Satsuma Background

Scientific name: *Citrus unshiu* Marcovitch

Type of mandarin

Like other citrus, originated in Asia.

Satsuma trees brought to U.S. from Japan in the late 1800s.

Widespread in North Florida & other southeastern states by early 1900s.



Satsuma Characteristics

Cold hardy, especially when grafted on trifoliolate rootstocks.

Relatively disease/pest resistant, but still susceptible to citrus scab, leaf minor, and potentially Huanglongbing (citrus greening) and others.

Considered seedless (0-6 seeds), easy to peel, and good eating quality.

Fruit harvested in October through December.

Does not ship as well as most other citrus.

Satsuma Markets

National average on-tree prices for tangerines and mandarins in recent years: \$0.27/lb to \$0.43/lb (mostly from California).

Florida average PHD price for fresh market tangerines in 2015: \$0.29/lb

Not widely available in national markets.

Local/regional markets may have potential for higher prices, but possibly higher marketing costs.

Retail satsuma prices: \$1.00 to \$2.00/lb for 3-lb or 5-lb bags.

Budget Assumptions

10-acre grove in North Florida

Owner managed

145 trees per acre (15'x20' or 12' x 25')

Microsprinkler irrigation & freeze protection

30-year productive lifespan with no major losses from disease or freeze



Initial Investments

Estimate: \$18,030 per acre, not including land cost

Includes:

Land prep

Electric hookup

8" well & pump with VFD

4" well & pump

Equipment shed

Fuel tank

Backup generator*

Irrigation system

Utility vehicle/ATV

Tractor (60 hp)

Fertilizer spreader

Rotary cutter/mower

Herbicide boom sprayer

Air-blast sprayer

Hand sprayer & tank

Trailer

Safety equipment/gear & hand tools

Grove Establishment & Maintenance

Planting & grove care operating costs (not including fixed overhead or interest):

Establishment (non-bearing) Years
per acre

- Year 1: \$3,198
- Year 2: \$1,445
- Year 3: \$1,500

Young Bearing Years (Years 4-8),
per acre: \$1,830

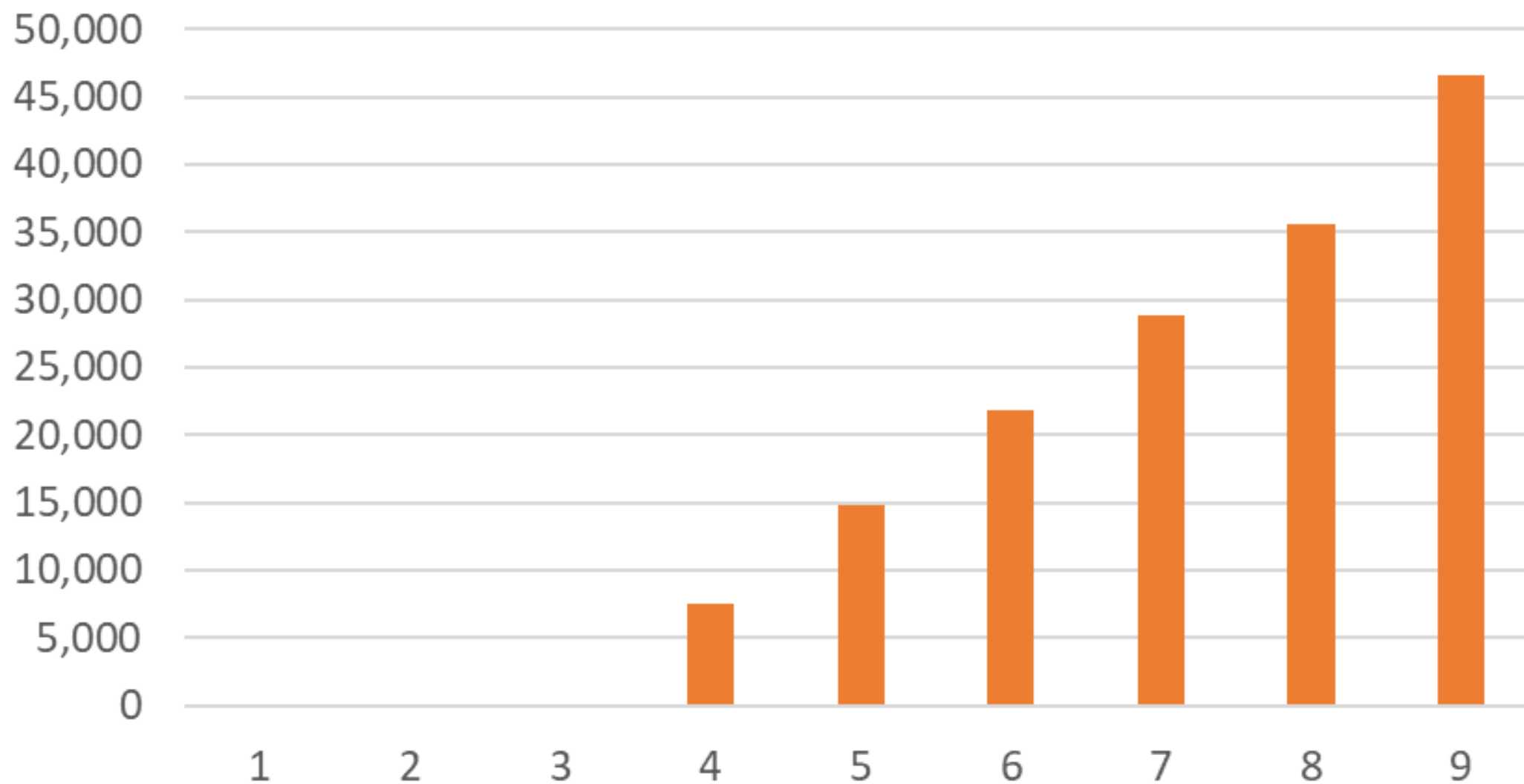
Mature Bearing Years (Years 9+),
per acre: \$2,007



Harvest Yield by Year

YIELD AND NUMBER OF TREES BY TREE AGE AND GROVE YEAR												
		Tree Density (trees/acre):			145			Replacement Rate (trees/year):			3	
		Grove Year & Number of Trees by Age										
Tree Age (years)		Harvest Yield (lbs/tree)	1	2	3	4	5	6	7	8	9	
1		0	145	3	3	3	3	3	3	3	3	
2		0	0	142	3	3	3	3	3	3	3	
3		0	0	0	139	3	3	3	3	3	3	
4		55	0	0	0	136	3	3	3	3	3	
5		110	0	0	0	0	133	3	3	3	3	
6		164	0	0	0	0	0	130	3	3	3	
7		219	0	0	0	0	0	0	127	3	3	
8		274	0	0	0	0	0	0	0	124	3	
9		365	0	0	0	0	0	0	0	0	121	
Harvest Yield (lbs/acre):			0	0	0	7,480	14,795	21,815	28,800	35,620	46,631	

Harvest Yield by Year (lbs/acre)



Revenue by Year

REVENUE PER ACRE BY GROVE YEAR

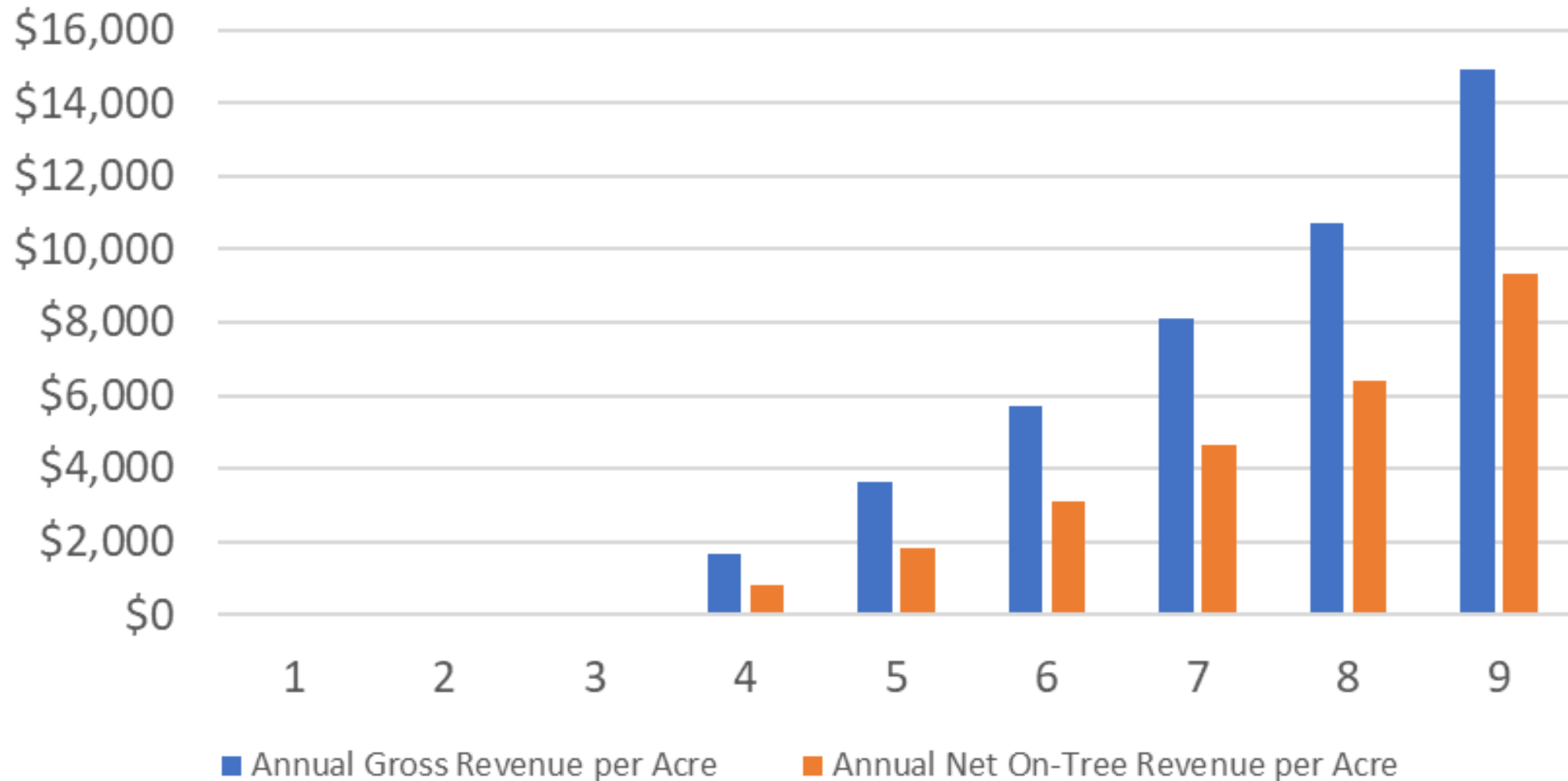
Product-Market-Terms	Selling Price (\$/lb)	Grove Year & Percent to Each Market								
		1	2	3	4	5	6	7	8	9
#1 Fresh Market, PHD	\$0.45	0%	0%	0%	40%	45%	50%	55%	60%	65%
#2 Fresh Market	\$0.15	0%	0%	0%	30%	28%	25%	23%	20%	18%
Processing Market	\$0.00	0%	0%	0%	0%	0%	0%	0%	0%	0%
Unmarketable Culls	\$0.00	0%	0%	0%	30%	27%	25%	22%	20%	17%
Annual Sales Revenue (\$/acre):		\$0	\$0	\$0	\$1,683	\$3,617	\$5,726	\$8,122	\$10,686	\$14,899

HARVESTING AND MARKETING COSTS PER ACRE BY GROVE YEAR

Cost Items	Cost (\$/lb)	Grove Year								
		1	2	3	4	5	6	7	8	9
Custom pick, roadside & haul	\$0.12	\$0	\$0	\$0	\$898	\$1,775	\$2,618	\$3,456	\$4,274	\$5,596
Annual Harvest & Marketing Cost (\$/acre):		\$0	\$0	\$0	\$898	\$1,775	\$2,618	\$3,456	\$4,274	\$5,596

ANNUAL NET ON-TREE REVENUE (\$/ACRE):	\$0	\$0	\$0	\$785	\$1,842	\$3,109	\$4,666	\$6,412	\$9,303
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Annual Revenue (\$/acre)



Annual Budget Summary for Mature Grove

ANNUAL REVENUE				
Product-Market-Terms	Sales Unit	Price per Unit	Units per Acre	Revenue per Acre
#1 fresh market, delivered to packinghouse (PHD)	lb	\$0.45	30,310	\$13,640
#2 fresh market, delivered to packinghouse (PHD)	lb	\$0.15	8,394	\$1,259
Unmarketable culls	lb	\$0.00	7,927	\$0
TOTAL ANNUAL REVENUE				\$14,899
ANNUAL OPERATING COSTS				
			Cost per Acre	
			NonCash	Cash
Harvesting & Marketing				\$5,596
Custom Pick, Roadside & Haul				\$5,596
Grove Care				\$2,163
Tree Replacement				\$67
Fertilizer & Soil Amendment				\$421
Weed Management				\$236
Insect/Disease Management				\$340
Scouting				\$234
Pruning				\$250
Irrigation				\$384
Freeze Protection				\$74
Interest on Operating Capital				\$156
TOTAL ANNUAL OPERATING COSTS			\$0	\$7,758

Annual Budget Summary for Mature Grove

ANNUAL FIXED OVERHEAD COSTS & ESTABLISHMENT COST RECOVERY

	Cost per Acre	
	Noncash	Cash
Grove Establishment Capital Recovery	\$1,292	\$0
Land Charge, Rental Opportunity Cost	\$164	\$0
Fixed Production Overhead (Infrastructure, Facilities, Equipment, Durables)	\$1,080	\$217
General Farm Overhead	\$150	\$650
TOTAL ANNUAL FIXED OVERHEAD COSTS	\$2,686	\$867

TOTAL COSTS & NET RETURNS PER ACRE

Total Annual Operating Costs:	\$7,758	Annual Net Return Over Operating Costs:	\$7,140
Total Annual Cash Costs:	\$8,625	Annual Net Return Over Cash Costs:	\$6,274
Total Annual Costs:	\$11,311	Annual Net Return Over Total Costs:	\$3,587

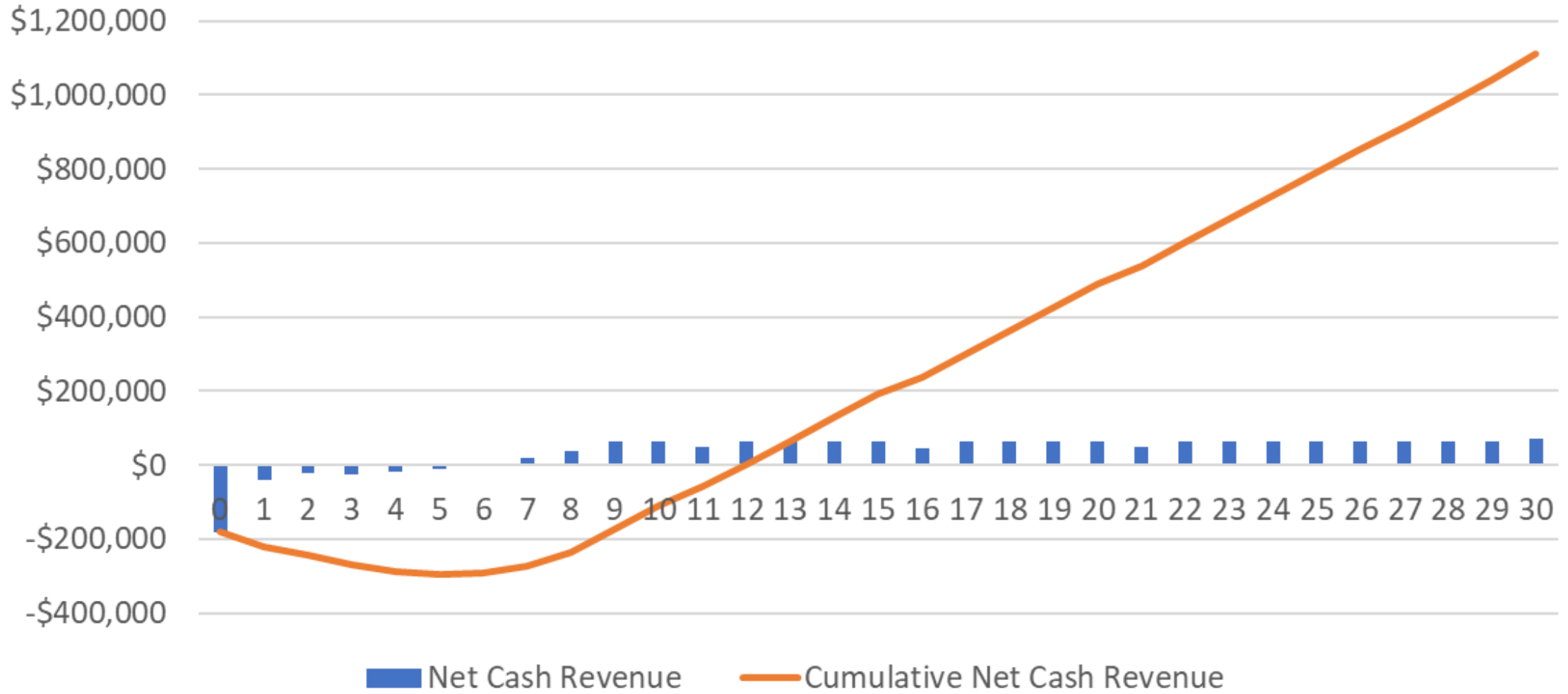
Sensitivity Analysis

SENSITIVITY ANALYSIS

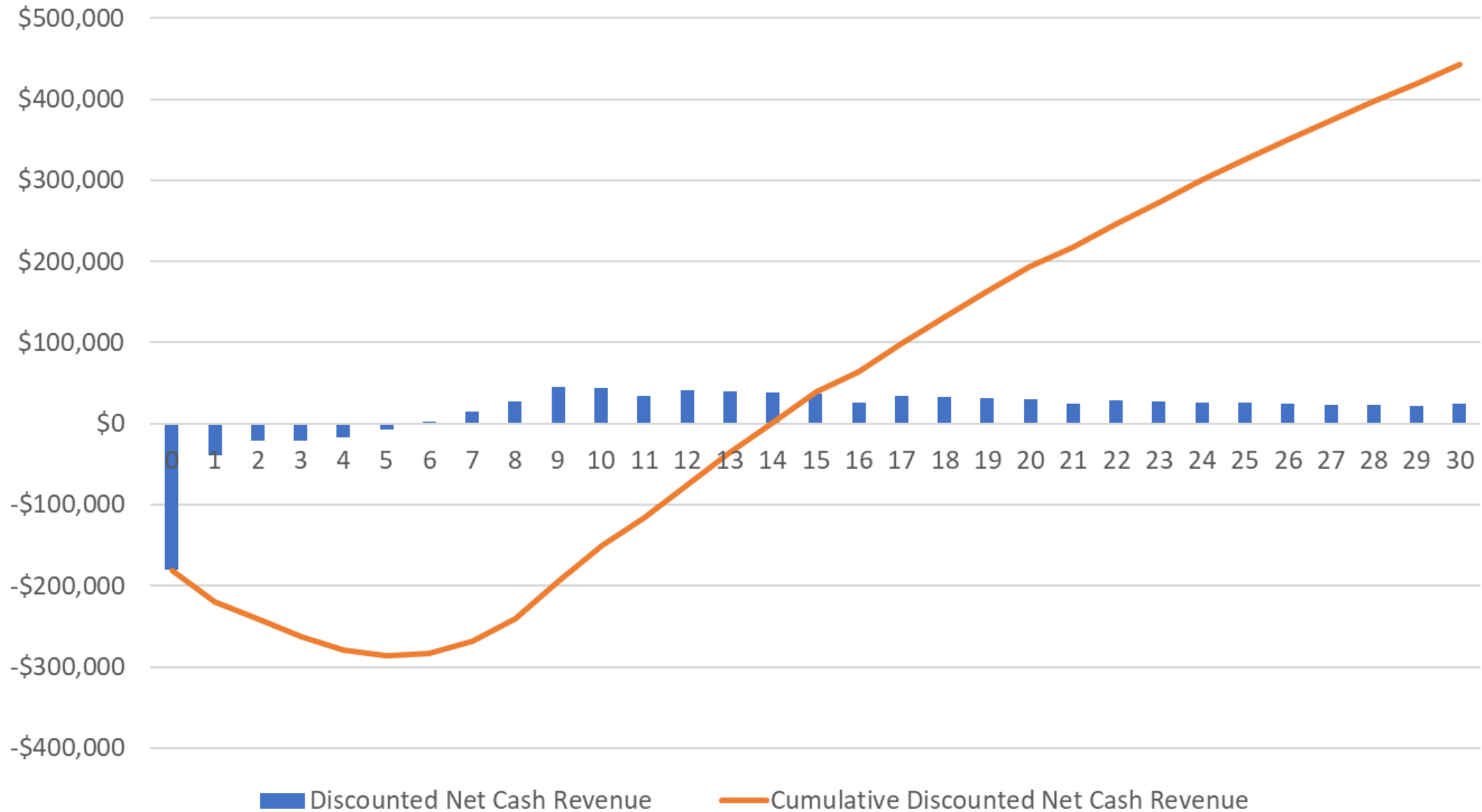
Annual Net Return over Total Costs per Acre for a Mature Grove

		Average Selling Price (\$/lb)				
		\$0.19	\$0.26	\$0.32	\$0.38	\$0.45
Harvested Yield (lbs/acre)	27,979	(\$3,757)	(\$1,798)	(\$120)	\$1,559	\$3,518
	37,305	(\$3,104)	(\$493)	\$1,746	\$3,984	\$6,595
	46,631	(\$2,451)	\$813	\$3,611	\$6,409	\$9,673
	55,957	(\$1,798)	\$2,119	\$5,476	\$8,833	\$12,750
	65,283	(\$1,146)	\$3,424	\$7,341	\$11,258	\$15,828

Undiscounted Cash Flow



Discounted Cash Flows



Investment Analysis for 10-acre Grove

Payback Period:	12 years
Internal Rate of Return:	10%
Net Present Value:*	\$443,600

*Assuming annual real discount rate of 3.65%

Full analysis & report available at <http://edis.ifas.ufl.edu/fe1030>

Discussion

Risk:

- Potential for major losses from disease or freezes
- Labor availability & costs uncertain
- Product quality & packout rates
- Markets & prices

Risk management strategies?

Packing/processing/distribution infrastructure?

Market development?



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