

## Breakeven and Sensitivity Analysis In-Class Exercise (KEY)

Let's look at Andy's Fresh-Market Tomato enterprise budget.

1. Andy isn't quite sure that all of his production estimates are accurate, so he wants to know how much "wiggle room" he has with this operation. Calculate the lowest tomato yield that Andy can get and still be able to pay ("cover") all of his operating costs.

Minimum Yield Necessary to Cover Operating Costs = Total Operating Costs / Price/carton

**Short-run BE Yield = \$4,302.59 / \$10/carton = 430.3 cartons/acre**

**Note, this is less than the expected 500 cartons/acre, which is a good sign!**

2. Andy isn't sure what price (\$/carton) to charge for his tomatoes. What is the lowest price than Andy needs to charge to cover all of his operating costs?

Minimum Price Necessary to Cover Operating Costs = Total Operating Costs / Cartons Sold

**Short-run BE Price = \$4,302.59 / 500 cartons = \$8.61/carton**

**Note, this is less than the expected \$10/carton selling price, which is a good sign!**

3. Andy is thinking long term. What is the lowest price that he can charge for his tomatoes and still cover all of the expenses of growing tomatoes?

Long-Run Breakeven Price = Total Costs / Cartons Sold/acre

**Long-Run BE Price = \$5,077.59 / 500 cartons/acre = \$10.16/carton**

**Note – this is greater than the expected selling price – that means Andy needs to charge a higher price/carton than expected. Will his customers pay the higher price?**

4. What is the lowest number of cartons that Andy needs to grow and sell per acre to cover all of the expenses of growing tomatoes?

Long-Run Breakeven Quantity Sold = Total Costs / Selling Price/carton

**Long-Run BE Quantity = \$5,077.59 / \$10/carton = 507.8 cartons/acre**

**Note – this is greater than the expected yield/acre – that means Andy needs to get a higher yield/acre than he is expecting, if he only charges \$10/carton. Can he get a higher yield/acre without increasing his expenses too much?**

5. There has been a bumper crop of tomatoes this year. This greater supply of tomatoes has caused the selling price of tomatoes to drop significantly. What is the change in Return Above Operating Costs if Andy's selling price drops by 20%?

**A 20% decrease in price means his new selling price is \$8/carton ( $\$10 - (\$10 * 20\%)$ ). At \$8/carton, with no other changes in yield or inputs, the new Return Above Operating Costs is (\$302.59) (that's a negative \$302.59). That is a \$1,000 decrease in profitability due to the lower selling price.**

## Fresh-Market Tomatoes

25 lbs/carton

Revenues	Quantity	Units/Acre	Price	Total	
Tomatoes	500	cartons	\$8.00	/carton	\$4,000.00
Other					\$0.00
<b>Total Revenues</b>					<b>\$4,000.00 /acre</b>
<b>Variable Costs:</b>					
Fertilizer					
Nitrogen	80	lbs	\$0.45	/lb	\$36.00
Phosphorus	150	lbs	\$0.32	/lb	\$32.00
Potassium	150	lbs	\$0.30	/lb	\$45.00
Lime	0.5	tons	\$30.00	/ton	\$15.00
Custom Application	1	acre	\$21.00	/acre	\$21.00
Pest Scouting	8	times	\$10.00	/time	\$80.00
Herbicides	1	acre	\$95.00	/acre	\$95.00
Fungicides	1	acre	\$500.00	/acre	\$500.00
Insecticides	1	acre	\$207.00	/acre	\$207.00
Land Preparation					
Plastic Mulch installation & removal	1	acre	\$70.00	/acre	\$70.00
Plastic Mulch	1	acre	\$300.00	/acre	\$300.00
Drip Irrigation (tape & labor)	1	acre	\$150.00	/acre	\$150.00
Tomato Transplants	5000	acre	\$100.00	/1,000	\$500.00
Stakes	2500	acre	\$100.00	/1,000	\$250.00
Labor					
Planting transplants	1	acre	\$90.00	/acre	\$90.00
Staking & tying	16	hours	\$8.50	/hour	\$136.00
Marketing & advertising	1	acre	\$50.00	/acre	\$50.00
Hand harvest	1	acre	\$800.00	/acre	\$800.00
Pest Control	1	acre	\$17.00	/acre	\$17.00
Cartons, lids, shipping	500	cartons	\$1.50	/carton	\$750.00
Fuel	15	gallons	\$2.20	/gallon	\$33.00
Repairs - Tractors & implements	1	acre	\$9.00	/acre	\$9.00
Interest on Operating Capital	6%	3 months	\$4,239.00	/acre	\$63.59
<b>Total Variable Costs</b>					<b>\$4,302.59 /acre</b>
<b>Return Above Variable Costs</b>					<b>(\$302.59) /acre</b>
<b>Minimum Yield Necessary to Cover Variable Costs</b>					<b>537.8 cartons/acre</b>
<b>Minimum Price Necessary to Cover Variable Costs</b>					<b>\$8.61 /carton</b>
<b>Fixed Costs</b>					
Tractors & Implements	1	acre	\$125	/acre	\$125.00
Drip Irrigation Equipment	1	acre	\$500	/acre	\$500.00
Land Charge	1	acre	\$150	/acre	\$150.00
<b>Total Fixed Costs</b>					<b>\$775.00 /acre</b>
<b>Total Costs</b>					<b>\$5,077.59 /acre</b>
<b>Return Above Total Costs</b>					<b>(\$1,077.59) /acre</b>
<b>Minimum Yield Necessary to Cover Total Costs</b>					<b>634.7 cartons/acre</b>
<b>Minimum Price Necessary to Cover Total Costs</b>					<b>\$10.16 /carton</b>

697.415    \$1,000.00