

THE COST OF GROWING PEACHES IN WESTERN COLORADO

By

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Introduction

Peaches continue to be Colorado's most important fruit crop in terms of acreage and value with 2,400 bearing acres valued at \$22.4 million as of 2011. The total area devoted to peaches as of the 2007 Census of Agriculture is 2,663 acres, up 25 percent from the 2,125 peach tree acres in 2002.

According to the 2002 Colorado Fruit Tree Survey Mesa County accounts for nearly 74 percent (387,000 trees) of the state's total peach trees. Delta County remains a distant second with 21 percent of the total. Montrose and Montezuma Counties account for most of the remaining 26,000 trees. Nearly 90 percent of the peach trees are in conventional orchards, with eight percent in organic, and two percent in transitional orchards.

Numerous varieties of peaches are produced in the state. Cresthaven is the dominant variety, totaling nearly 12 percent of the total peach trees. Red Globe is a close second at 11.8 percent. Suncrest, which was the leading peach variety in 1994 (16 percent), declined to 10.9 percent of all fruit trees. Redhaven, Glohaven, and Newhaven varieties each accounted for just fewer than 7 percent of the total.

Colorado peaches have a superior market acceptance because of good flavor, color and timing of harvest. However, peach production in Colorado, like many growing areas in the United States, is challenging due to the many environmental stresses. Spring frosts, persistent Cytospora canker disease, replant diseases, and heavy, calcareous soils are just a few of the stresses that peaches must tolerate. Successful growers understand how trees respond to various stresses and utilize this knowledge to maximize tree productivity and fruit quality.

This report contains typical orchard costs and returns that you can compare to your own orchard. The establishment and annual operating costs (direct and indirect) are estimated for a "representative" orchard in Western Colorado. Due to the variability of circumstances faced by individual orchards, some fixed costs such as land, deer/elk fencing, taxes, and insurance are not explicitly included in our cost estimates. Major land preparation such as timber clearing, rock removal, or land leveling is also ignored. These operations, if required, should be factored in to your own analysis. Site selection, peach variety, pest management and other cultural practices will also affect orchard establishment and operating costs. It is assumed some form of frost protection (heaters or wind machines) is included in the initial investment.

The following budgets were developed using practices and materials that have proven both practical and cost effective in Colorado. Enterprising growers might find alternative materials or practices to reduce operating costs without impairing orchard productivity or peach quality.

Basic Findings

The profitability and investment returns of peach orchards depend on five major factors:

- Sound production practices.
- Consistently good yields.
- Consistently good prices.
- Reasonable investment and establishment costs.
- Low operating costs.

First, you must have good production management skills. A good producer will select the best site possible and manage the trees to the highest level. This requires sound management decisions that can directly affect quality and quantity of the crop. Cultural management decisions such as site and variety selection, soil fertility, irrigation, pest, disease and weed control.

Second, peach yields must be consistent over the productive lifespan of the orchard. The training systems and pruning decision choices are important for maintaining high yields. Proper peach training and pruning maximizes the bearing surface with uniform light distribution. Peaches are sensitive to light and poor light distribution results in fewer fruit and poor fruit quality. Reduced yields due to frost or poor management will require more time to recover establishment and operational costs

Third, prices received by farmers for harvested peaches are a key to profitability. According to Colorado Agricultural Statistics, market prices received by farmers from 2003 to 2011 for peaches in Colorado typically range from as low as \$0.47 (2004) per pound to as high as \$0.94 (2010 and 2011) per pound. Like most agricultural commodities, there are many factors that determine the market price received in a given year. Individual growers may get more or less depending on variety, production (supply), method of marketing, fruit quality, and year-to-year volatility in markets.

Fourth, what you pay for land, equipment and other capital expenditures is important to determine profitability. Land prices vary considerably in western Colorado with small (1-5 acre) prime fruit growing parcels usually demanding the highest price. Equipment can be purchased new or used, leased, borrowed, or purchased with the land and can dramatically alter costs. Capital expenses such as an irrigation system may be reduced because of government cost-share programs or maybe the system was purchased with the land. Necessary capital expenditures are related to tree density and orchard site. Thus the capital investment varies for each situation.

The fifth important factor is annual operating costs. Controlling costs to increase or maintain profits has always been an important management strategy in all businesses. Cost reduction strategies should only be implemented if they make sense. If the value of production decreases more than the cost savings then the exercise was counterproductive. Look for areas to control costs that may increase production or maintain existing levels of production first. Then look for areas where cost savings are greater than any reduction in the value of lost production.

All of these factors directly affect the profitability and investment return of your orchard.

Assumptions

Site

The representative orchard addressed in the budgets is established on open land with no improvements and where the hazards of winter cold injury and spring frosts are minimal. Even the best orchard sites in western Colorado can expect crop yield reduction due to freeze or frost injury. Most growers expect a total loss due to frost about 10 percent of the time and partial losses another 10-15 percent of time.

Labor

The wage rate for labor is the net cost to growers. Unskilled labor is valued at \$11.00 per hour (\$9.00 wage rate plus \$2.00 per hour payroll expenses). Skilled labor is valued at \$15.00 per hour. Skilled labor is typically denoted as an equipment operator.

Peach Trees

The cost to purchase trees to establish a peach orchard can vary significantly. Most tree plantings range from \$4.00-\$8.00 per tree depending on variety, individual nursery pricing, size, royalty, number purchased, shipping costs, etc. \$6.50 is a common cost per tree. Replanting is done as necessary, typically 2-5 percent of original planting.

Planting densities have been increasing over time from an average of 400 trees per acre to over 500 trees per acre. Recent plantings typically use a 12x8, 10x8, 12x5, or 10x5 spacing (453-871 trees per acre).

Irrigation

Most peach orchards in western Colorado are irrigated with gated pipe furrow or micro sprinklers. A \$20,000 irrigation system (Table 1) is capable of irrigating a 15-20-acre orchard. Irrigation investment costs can be reduced somewhat to accommodate a smaller acreage. The current cost of an irrigation system, which includes labor and materials, is approximately \$600-\$2,500 per acre, depending on the type of system.

Peach Prices

The recent (10 year) Colorado market year average price for peaches has ranged from a low of \$.47 per pound to over \$0.93 per pound. Peach prices vary substantially by variety, amount of product available, and method of marketing. According to Colorado Ag Statistics the average price for all peaches in Colorado the last 5 years was \$0.84 per pound, so for budgeting purposes, a price of \$0.85 per pound was used in this analysis.

Tax Impacts

No tax impacts have been included in this analysis. There are important tax considerations that should be discussed with your accountant prior to orchard investment.

Equipment

The equipment listed in Table 1 is enough to adequately service and manage a 15-20-acre orchard. Costs are based on new machinery and equipment costs. Total machinery expense can vary substantially, depending on grower preference. There are alternatives to purchasing new equipment. Purchasing used equipment, leasing equipment, custom hiring, and group purchasing are all alternatives that should be considered.

Table 1: Equipment Requirements-Peach Orchard, Western Colorado

Interest Rate:	8.00 percent						
Acreage Capacity:	20 acres						
Annual Cost Per Acre							
Machine	Purchase Price	Salvage Value	Useful Life	Annual Cost	2-acres	10-acres	20-acres
Tractor 30 hp	17,000	1,700	10	2,805	1,403	281	140
Tractor 50 hp	20,000	2,000	10	3,300	1,650	330	165
Pickup	30,000	3,000	8	5,625	2,813	563	281
Sprayer Equipment	10,000	1,000	10	1,650	825	165	83
Weed Sprayer	4,000	400	10	660	330	66	33
Tandem Disc	6,000	600	10	990	495	99	50
PTO Mower	5,000	500	10	825	413	83	41
Landplane	3,000	300	10	495	248	50	25
Auger	1,500	150	10	248	124	25	12
Harrow	1,000	100	10	165	83	17	8
Frost Control	25,000	2,500	20	3,000	1,500	300	150
Irrigation Equipment	24,000	2,400	20	2,880	1,440	288	144
Shop Tools	2,500	250	20	300	150	30	15
Other Misc. Equipment	3,000	300	20	360	180	36	18
Total Machinery Investment	\$152,000			\$23,303	\$11,651	\$2,330	\$1,165

Salvage Value=10 Percent of Purchase Value

Annual Cost = (Depreciation + Interest (Opportunity Cost) + Insurance + Housing

Depreciation = Purchase Price – Salvage Value ÷ Useful Life

Interest (Opportunity Cost) = Purchase Price x (Interest Rate – 2% Inflation Rate)

Insurance = 0.5 % of Purchase Price

Housing = 1.0 % of Purchase Price

Costs and Returns

The annual budgets in Tables 2-6 show annual production expenses and cash inflows from sales. The first budget, Table 2, represents the direct and indirect costs of establishing a peach orchard, excluding machinery and irrigation equipment. Land, equipment and irrigation costs are highly variable and therefore will be discussed in later sections. The establishment and year one- production expenses are estimated at \$5,183.72 per acre. This cost could rise to over \$7,000 per acre for higher-density plantings (10'x5').

Tables 3 through 5 show production expenses and cash inflows for the transition period (years 2 through 5) from establishment to maintenance. Total accumulated net returns, annual revenues minus expenses, show how much is available to pay off establishment costs (land, equipment, etc.), including interest. Total accumulated expenses peak in year 3 and in year 6 the orchard begins generating a positive accumulated cash flow.

Table 6 represents production expenses and cash sales for maintenance years, 6 through 20. Once the orchard is established and operating at full production, expenses and sales are assumed to be constant. A well-managed orchard can be productive for 20 years and 30 to 40 years are not unusual. In this analysis, we assume an orchard life of 20 years.

Table 2: Peach Establishment and Year 1 Production Expenses

Operation		Units	Unit Cost	Units Per Acre	Cost Per Acre	Your Estimate
<u>Site Preparation</u>						
Deep Ripping (custom)		acre	150.00	1	150.00	_____
MB Plow (custom)		acre	25.00	1	25.00	_____
Disc (custom)		acre	20.00	1	20.00	_____
Soil Sample		samples	28.00	3	84.00	_____
Float/Landplane (custom)		acre	12.00	1	12.00	_____
<u>Orchard Layout and Planting</u>						
Trees		trees	6.50	545	3542.50	_____
Custom Planting		trees	0.50	545	272.50	_____
Trimming and Training Labor		hrs.	11.00	70	770.00	_____
<u>Machinery (cash operating)</u>						
Fuel and Lubrication		acre	60.00	1	60.00	_____
Repairs and Maintenance		acre	36.00	1	36.00	_____
<u>Pest Control - Weeds</u>						
Gramoxone		quarts	8.88	2	17.76	_____
<u>Fertilization</u>						
18-6-6		lbs.	0.32	140	44.80	_____
<u>Operating Interest</u>						
1/2 Year 1 Expenses		dol.	0.06	2,486	149.16	_____
Total Year 1 Establishment/Production Expenses					\$5,183.72	_____
Cash Inflows From Sales					\$0.00	_____
Net - Year 1					-\$5,183.72	_____

Table 3: Peach Production Expenses - Years 2 & 3

Operation	Units	Unit Cost	Units Per Acre	Cost Per Acre	Your Estimate
<u>Labor</u>					
Pruning	hours	11.00	30	330.00	_____
Prunings Removal	hours	11.00	4	44.00	_____
Spraying	hours	11.00	7	77.00	_____
Tillage/Mowing	hours	15.00	15	225.00	_____
Thinning	hours	11.00	0	0.00	_____
Irrigation	hours	11.00	15	165.00	_____
Fertilization	hours	15.00	12	180.00	_____
<u>Machine Costs</u>					
Repairs	acre	150.00	1	150.00	_____
Fuel & Lube	acre	85.00	1	85.00	_____
<u>Pest Control - Weeds</u>					
Gramoxone	quarts	8.87	2	17.74	_____
<u>Fertilization</u>					
18-6-6	lbs.	0.32	140	44.80	_____
<u>Replanting</u>					
Trees	trees	6.50	27	175.50	_____
Custom Planting	trees	0.50	27	13.50	_____
<u>Irrigation Expenses</u>					
Water	acre	60.00	1	60.00	_____
Irrigation	acre	50.00	1	50.00	_____
<u>Miscellaneous Expenses</u>					
Crop Insurance	acre	0.00	1	0.00	_____
Utilities	acre	250.00	1	250.00	_____
Supplies	acre	300.00	1	300.00	_____
Property Taxes	acre	75.00	1	75.00	_____
Professional Fees	acre	200.00	1	200.00	_____
<u>Operating Interest</u>					
1/2 Year 2 Expenses	dol.	0.06	808.77	48.53	_____
Interest on Year 1 Accrued Expenses	dol.	0.06	5,183.72	311.02	_____
Total Year 2 Production Expenses					\$2,802.09 _____
Total Year 3 Production Expenses					\$2,802.09 _____
CASH INFLOWS FROM SALES					0 0 \$0.00 _____
Net - Years 2 & 3					-\$5,604.18 _____
TOTAL ACCUMULATED NET RETURNS					-\$10,787.90 _____

Table 4: Peach Orchard Production Expenses - Year 4

Operation		Units	Unit Cost	Units Per Acre	Cost Per Acre	Your Estimate
Labor						
Pruning		hours	11.00	50	550.00	_____
Prunings Removal		hours	11.00	8	88.00	_____
Spraying		hours	11.00	7	77.00	_____
Tillage/Mowing		hours	15.00	15	225.00	_____
Thinning		hours	11.00	50	550.00	_____
Irrigation		hours	11.00	15	165.00	_____
Fertilization		hours	15.00	12	180.00	_____
Harvest		hours	11.00	60	660.00	_____
Machine Costs						
Repairs		acre	150.00	1	150.00	_____
Fuel & Lube		acre	85.00	1	85.00	_____
Pest Control						
Gyustar (Weeds)		quarts	5.50	2	11.00	_____
Oil (Aphids/Mites)		gallon	7.75	4	31.00	_____
Delegate (Twig Borer)		ounce	8.95	6	53.70	_____
Altocor (Twig Borer)		ounce	14.75	2	29.50	_____
Pristine (Powdery Mildew/Coryneum		ounce	3.61	12	43.32	_____
Isomate P (Crown Borer)		acre	47.00	1	47.00	_____
Fertilization						
18-6-6		lbs.	0.32	280	89.60	_____
Replanting						
Trees		trees	6.50	11	71.50	_____
Custom Planting		trees	0.50	11	5.50	_____
Irrigation Expenses						
Water		acre	60.00	1	60.00	_____
Irrigation		acre	50.00	1	50.00	_____
Miscellaneous Expenses						
Crop Insurance		acre	90.00	1	90.00	_____
Utilities		acre	250.00	1	250.00	_____
Supplies		acre	300.00	1	300.00	_____
Property Taxes		acre	75.00	1	75.00	_____
Professional Fees		acre	200.00	1	200.00	_____
Operating Interest						
1/2 Year 2 Expenses		dol.	0.06	2,068.56	124.11	_____
Interest on Year 1 Accrued Expenses		dol.	0.06	10,787.90	647.27	_____
Total Year 4 Production Expenses					\$4,908.51	_____
CASH INFLOWS FROM SALES			0.85	6,240	\$5,304.00	_____
Net - Year 4					\$395.49	_____
TOTAL ACCUMULATED NET RETURNS					-\$10,392.41	_____

Table 5: Peach Orchard Production Expenses - Year 5

Operation		Units	Unit Cost	Units Per Acre	Cost Per Acre	Your Estimate
Labor						
Pruning		hours	11.00	50	550.00	_____
Prunings Removal		hours	11.00	8	88.00	_____
Spraying		hours	11.00	7	77.00	_____
Tillage/Mowing		hours	15.00	15	225.00	_____
Thinning		hours	11.00	50	550.00	_____
Irrigation		hours	11.00	15	165.00	_____
Fertilization		hours	15.00	12	180.00	_____
Harvest		hours	11.00	80	880.00	_____
Machine Costs						
Repairs		acre	150.00	1	150.00	_____
Fuel & Lube		acre	85.00	1	85.00	_____
Pest Control						
Gyustar (Weeds)		quarts	5.50	2	11.00	_____
Oil (Aphids/Mites)		gallon	7.75	4	31.00	_____
Delegate (Twig Borer)		ounce	8.95	6	53.70	_____
Altocor (Twig Borer)		ounce	14.75	2	29.50	_____
Pristine (Powdery Mildew/Coryneum)		ounce	3.61	12	43.32	_____
Isomate P (Crown Borer)		acre	47.00	1	47.00	_____
Fertilization						
18-6-6		lbs.	0.32	280	89.60	_____
Replanting						
Trees		trees	6.50	11	71.50	_____
Custom Planting		trees	0.50	11	5.50	_____
Irrigation Expenses						
Water		acre	60.00	1	60.00	_____
Irrigation		acre	50.00	1	50.00	_____
Miscellaneous Expenses						
Crop Insurance		acre	90.00	1	90.00	_____
Utilities		acre	250.00	1	250.00	_____
Supplies		acre	300.00	1	300.00	_____
Property Taxes		acre	75.00	1	75.00	_____
Professional Fees		acre	200.00	1	200.00	_____
Operating Interest						
1/2 Year 2 Expenses		dol.	0.06	2,178.56	130.71	_____
Interest on Year 1 Accrued Expenses		dol.	0.06	10,392.41	623.54	_____
Total Year 5 Production Expenses					\$5,111.38	_____
CASH INFLOWS FROM SALES			0.85	12,480	\$10,608.00	_____
Net - Year 5					\$5,496.62	_____
TOTAL ACCUMULATED NET RETURNS					-\$4,895.78	_____

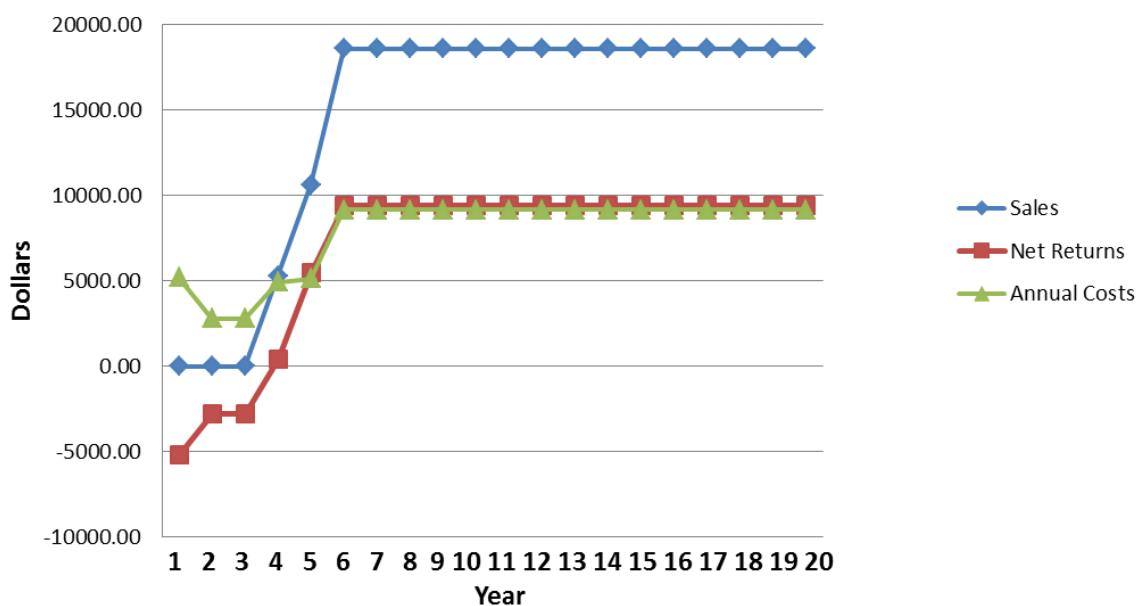
Table 6: Peach Orchard Production Expenses - Year 6-20

Operation		Units	Unit Cost	Units Per Acre	Cost Per Acre	Your Estimate
<u>Labor</u>						
Pruning		hours	11.00	70	770.00	_____
Prunings Removal		hours	11.00	8	88.00	_____
Spraying		hours	11.00	7	77.00	_____
Tillage/Mowing		hours	15.00	15	225.00	_____
Thinning		hours	11.00	60	660.00	_____
Irrigation		hours	11.00	15	165.00	_____
Fertilization		hours	15.00	12	180.00	_____
Harvest		hours	11.00	90	990.00	_____
<u>Machine Costs</u>						
Repairs		acre	150.00	1	150.00	_____
Fuel & Lube		acre	85.00	1	85.00	_____
<u>Pest Control</u>						
Gyustar (Weeds)		quarts	5.50	2	11.00	_____
Oil (Aphids/Mites)		gallon	7.75	4	31.00	_____
Delegate (Twig Borer)		ounce	8.95	6	53.70	_____
Altocor (Twig Borer)		ounce	14.75	2	29.50	_____
Pristine (Powdery Mildew/Coryneum)		ounce	3.61	12	43.32	_____
Isomate P (Crown Borer)		acre	47.00	1	47.00	_____
<u>Fertilization</u>						
18-6-6		lbs.	0.32	280	89.60	_____
<u>Replanting</u>						
Trees		trees	6.50	11	71.50	_____
Custom Planting		trees	0.50	11	5.50	_____
<u>Irrigation Expenses</u>						
Water		acre	60.00	1	60.00	_____
Irrigation		acre	50.00	1	50.00	_____
<u>Miscellaneous Expenses</u>						
Crop Insurance		acre	90.00	1	90.00	_____
Utilities		acre	250.00	1	250.00	_____
Supplies		acre	300.00	1	300.00	_____
Property Taxes		acre	75.00	1	75.00	_____
Professional Fees		acre	200.00	1	200.00	_____
Marketing		lbs.	0.18	21,840	3931.20	_____
<u>Operating Interest</u>						
1/2 Year 2 Expenses		dol.	0.06	2,398.56	143.91	_____
Interest on Year 1 Accrued Expenses		dol.	0.06	4,895.78	293.75	_____
Total Year 6-20 Production Expenses					\$9,165.98	_____
CASH INFLOWS FROM SALES			0.85	21,840	\$18,564.00	_____
Net - Years 6-20					\$9,398.02	_____

Profitability without Including Initial Start-up Costs

Peach production has potential to generate profits in western Colorado when properly managed. Figure 1 charts the annual sales, production costs and net returns per acre for a "representative" western Colorado orchard, not including equipment or other fixed ownership costs. Sales are zero for the first three years while the trees are getting established. The orchard should produce a small crop in year 4 (20 lbs. per tree) and increase every year through year 6. A 70-pound (with 80 percent pack out) per tree yield was assumed to be maintained for years 6 through 20. There are many factors (environmental, cultural, pest management, varieties, etc.) that can cause yield variation. Realistic estimates of yield and market prices are important factors to consider before investing in a peach orchard.

**Figure 1: Estimated Sales, Annual Costs, and Net Returns Per Acre
for Peach Orchard, Western Colorado**



Profitability Including Equipment

Machinery and equipment ownership costs, including depreciation and interest are itemized in Table 1. These costs are fixed and do not change with the level of output. The total machinery purchase costs are estimated to be \$152,000. Over a twenty-year period, every piece of equipment except for the frost control, irrigation, shop tools, and miscellaneous equipment would have to be replaced once. Therefore, in ten years, another \$97,500 plus inflation will have to be spent. At a 4 percent real cost of money, \$65,868 must be set aside today to buy equipment in ten years. Total equipment cost for a twenty-year orchard in today's dollars is therefore \$217,868 ($152,000 + 65,868$).

Even though we show some profit, a small acreage would have difficulty generating a decent return on the investment. As shown in Table 7, an orchard could invest up to \$80,674 per acre (\$0.85 per pound average market price for peaches). If a full equipment set was purchased as described in Table 1, the maximum investment for land (\$/acre) would be \$4,674, \$65,474, and \$73,074 for 2 acre, 10 acre, and 20 acre orchard respectively. Figure 2 illustrates net returns by orchard size with and without equipment costs.

Figure 2: Per Acre Net Returns by Orchard Size, Western Colorado

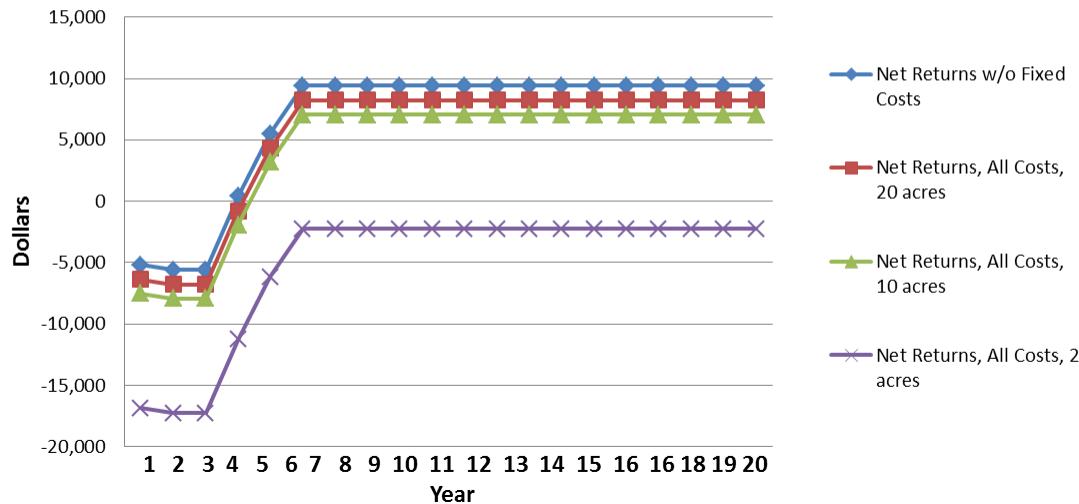


Table 7: Peach Profitability and Price Sensitivity

Year	Production Expenses	Peach Yield (lbs./acre)	Price: \$0.60 per pound			Price: \$0.85 per pound			Price: \$1.00 per pound		
			Gross Returns	Net Returns	Accumulated Returns	Gross Returns	Net Returns	Accumulated Returns	Gross Returns	Net Returns	Accumulated Returns
1	5,184	0	0	-5,184	-5,184	0	-5,184	-5,184	0	-5,184	-5,184
2	2,802	0	0	-2,802	-7,986	0	-2,802	-7,986	0	-2,802	-7,986
3	2,802	0	0	-2,802	-10,788	0	-2,802	-10,788	0	-2,802	-10,788
4	4,909	6240	3,744	-1,165	-11,952	5,304	395	-10,392	6,240	1,331	-9,456
5	5,111	12480	7,488	2,377	-9,576	10,608	5,497	-4,896	12,480	7,369	-2,088
6	9,166	21840	13,104	3,938	-5,638	18,564	9,398	4,502	21,840	12,674	10,586
7	9,166	21840	13,104	3,938	-1,700	18,564	9,398	13,900	21,840	12,674	23,260
8	9,166	21840	13,104	3,938	2,238	18,564	9,398	23,298	21,840	12,674	35,934
9	9,166	21840	13,104	3,938	6,176	18,564	9,398	32,696	21,840	12,674	48,608
10	9,166	21840	13,104	3,938	10,114	18,564	9,398	42,094	21,840	12,674	61,282
11	9,166	21840	13,104	3,938	14,052	18,564	9,398	51,492	21,840	12,674	73,956
12	9,166	21840	13,104	3,938	17,990	18,564	9,398	60,890	21,840	12,674	86,630
13	9,166	21840	13,104	3,938	21,928	18,564	9,398	70,288	21,840	12,674	99,304
14	9,166	21840	13,104	3,938	25,866	18,564	9,398	79,686	21,840	12,674	111,978
15	9,166	21840	13,104	3,938	29,804	18,564	9,398	89,084	21,840	12,674	124,652
16	9,166	21840	13,104	3,938	33,742	18,564	9,398	98,482	21,840	12,674	137,326
17	9,166	21840	13,104	3,938	37,680	18,564	9,398	107,880	21,840	12,674	150,000
18	9,166	21840	13,104	3,938	41,618	18,564	9,398	117,278	21,840	12,674	162,674
19	9,166	21840	13,104	3,938	45,556	18,564	9,398	126,676	21,840	12,674	175,348
20	9,166	21840	13,104	3,938	49,495	18,564	9,398	136,075	21,840	12,674	188,023
Maximum Investment (\$/acre incl. mach./equip.)			\$26,880			\$80,674			\$112,950		
Maximum Land Investment (\$/acre)											
2 acre orchard			-\$49,120			\$4,674			\$36,950		
10 acre orchard			\$11,680			\$65,474			\$97,750		
20 acre orchard			\$19,280			\$73,074			\$105,350		

Sensitivity of Results – Factors That Can Change These Results

The results in Table 7 are based on our estimates about what average production looks like in western Colorado. However, most producers are not average. Therefore, we varied some of our assumptions to examine how that could impact our results in a positive or negative direction. Carefully examine where your operation fits and where you can make changes to take full advantage of making your operation profitable.

Output Price

Peach orchard profitability is highly affected by the price of peaches. As shown in Table 7, a reduction in output price from \$0.85 to \$0.60 per pound reduced the investment return from \$83,194 to \$26,880 per acre. An output price increase to \$1.00 per pound increases the maximum investment to \$112,950. If for some reason prices fall to \$0.40 per pound, you cannot make money on a twenty-acre orchard, while holding our other assumptions constant.

Peach prices may increase over time due to increased demand, Colorado peaches gaining market share, or inflationary pressures.

Equipment Costs

As demonstrated above, equipment costs can make or break an orchard. In this example, it is assumed that a full complement of machinery is purchased and owned. For smaller acreages, it may be beneficial to hire custom operators to perform custom machine operations instead of owning every piece of equipment. Alternatively, equipment costs will be reduced if your equipment is used for other purposes or shared with someone else. You can afford to pay \$80,674 per acre for all investment. You can determine how much you can afford for equipment by subtracting the land price from these amounts. In our example, approximately \$217,868 in today's dollars is required for an equipment complement that will last for the next twenty years, counting replacing some pieces. Setting up cooperative or sharing equipment with someone else that is starting an orchard could benefit both parties. Of course the logistics for cooperating, sharing, or renting equipment can be difficult to overcome, but the economic incentives for doing so are very strong.

Production Yields and Costs

Our results are highly influenced by our assumptions about your costs of production and yields. Many people get higher yields than 70 pounds per tree or have lower costs of production. Therefore, we looked at how much you could afford to invest for land and land preparation if you have higher yields, lower costs or both. Our higher yield assumption assumes that you could get a 25 percent higher yield (88 lbs. per tree) on a regular basis. Low cost assumes that you could reduce costs by 10 percent. Finally, we provide the results for a producer that gets higher yields and lower costs. This is the most unlikely scenario since higher yields usually are associated with higher costs.

Even the best of conditions do not produce enough returns to purchase land in many of our quality production areas if you only have ten acres—although it helps a lot. However, if you have twenty acres, you probably produce enough income to purchase high quality land and make a return. The picture would improve further if you received higher prices or lowered your equipment costs as described earlier.

Table 8: Maximum Land Investment

	<u>10 Acre Orchard</u>	<u>20 Acre Orchard</u>
Average (Typical) Management	\$67,994	\$75,194
Low Cost (Reduced 10%)	\$68,242	\$110,241
High Yield (Increased 25%)	\$113,719	\$121,319
Low Cost/High Yield	\$123,690	\$131,290

Catastrophic Event

Historically, the peach growing regions of Colorado experience a catastrophic freeze episode about twice every twenty years. Just for example, we calculated the economic effect of a catastrophic freeze event in year 6 and year 16 in the life of the orchard. A complete freeze out in years 6 and 16 will reduce the maximum investment by \$24,593 per acre. Most growers purchase crop insurance to protect them from catastrophic losses.

Conclusions

Colorado has the potential to make money with peach orchards. However, high land prices and equipment costs make it unlikely to be profitable on small acreages. Of course, not everyone is in the business to make money. But, for those who are, careful land selection, skilled management, and size are important. For smaller growers, orchards can be made more profitable by reducing equipment costs and land costs. Sharing equipment with other enterprises or neighbors, renting, or buying used can reduce equipment costs. Using your land for other purposes, such as your home, tourism, bed and breakfast or other crops may reduce land prices.

References

1. Colorado Agricultural Statistics 2012. National Agricultural Statistics Service and Colorado Department of Agriculture. July 2012.
2. Colorado Fruit Tree Survey 2002. National Agricultural Statistics Service and Colorado Department of Agriculture. August 2002.
3. Murray, Marion, et al. "2013 Intermountain Tree Fruit Production Guide". Utah State University, Cooperative Extension, Colorado State University Extension, University of Idaho Extension, http://www.colostate.edu/programs/wcrc/pubs/research_outreach/fruitpestdisease.htm, 2013.