

THE COST OF GROWING PEACHES IN WESTERN COLORADO

By

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Introduction

Peaches have become Colorado's most important fruit crop in terms of production with 520,000 trees in orchards as of January 1, 2002. The latest count represents an increase of 11 percent from the 1994 inventory of 400,000 trees. This is the largest number of peach trees in the state since the 1967 inventory of 612,000 peach trees. New plantings have been very active with 16 percent of the total being planted since 1998. The total area devoted to peaches as of January 1, 2002 totaled 2,015 acres, down 3 percent from the 2,080 acres of peach trees in 1994. Recent plantings have been focused towards increased number of trees per acre. Nearly 90 percent of the peach trees are in conventional orchards, with eight percent in organic orchards, and two percent in transitional orchards.

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.

Numerous varieties of peaches are produced in the state. Cresthaven is the dominant variety, totaling 62,000 trees and nearly 12 percent of the total peach trees. Red Globe is a close second with 60,900 trees. Suncrest, which was the leading peach variety in 1994 with 62,500 trees (16 percent), declined to 56,400 trees representing just fewer than 11 percent of the January 1, 2002 inventory 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, low winter temperatures, persistent Cytospora canker disease, 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. The "Growing Peaches: A Guide for Western Colorado and the Rocky Mountain Region" (Bulletin 570A) is an excellent resource for production practices and the particular needs for growing peaches in a high desert environment.

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 variety selection, soil fertility, irrigation, pest, disease and weed control. Consult the "Growing Peaches Guide" for recommended management practices.

Second, peach yields must be consistently good. The training systems and pruning decision choices are important for maintaining good 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 size and color. Lower yields due to frost or poor management will require more time to recover establishment and operational costs. Higher yields can be achieved with good management and growing conditions.

Third, prices received by farmers for harvested peaches are key to profitability. According to Colorado Agricultural Statistics, average market prices received by farmers for peaches in Colorado typically range from as low as \$0.31 per pound to as high as \$0.70 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, is what you pay for land, equipment and other capital expenditures. 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 investment can be different 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 types of businesses. However, it is not good management to cut costs just for the sake of cutting costs. 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 counter productive. 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 rates for labor is the net cost to growers. Unskilled labor is valued at \$8.00 per hour (\$6.00 wage rate plus \$2.00 per hour payroll expenses). Skilled labor is valued at \$9.00 per hour. Skilled labor is typically denoted as a 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 5 percent of original planting.

Planting densities typically vary from 256-512 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 \$.31 per pound to over \$0.66 per pound. Peach prices vary substantially by variety, amount of product available, and method of marketing. For budgeting purposes, a price of \$0.55 per pound was used.

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: 8.0%
 Acreage Capacity: 20 acres
 Year: 2003

<u>Machine</u>	<u>Purchase Price</u>	<u>Salvage Value</u>	<u>Useful Life</u>	<u>Annual Cost</u>	<u>Annual Cost Per Acre</u>		
					<u>2 Acres</u>	<u>10 Acres</u>	<u>20 Acres</u>
Tractor 30 hp	20,000	1,500	10	2,710	1,355	271	136
Tractor 50 hp	30,000	3,000	10	4,020	2,010	402	201
Pickup	20,000	2,000	8	3,130	1,565	313	157
Sprayer equipment	10,000	1,000	10	1,340	670	134	67
Weed Sprayer	1,000	100	10	134	67	13	7
T. Disc	6,000	600	10	804	402	80	40
PTO Mower	5,000	500	10	670	335	67	34
Landplane	3,000	300	10	402	201	40	20
Auger	1,500	150	10	201	101	20	10
Harrow	1,000	100	10	134	67	13	7
Frost Control	20,000	2,000	20	1,780	890	178	89
Irrigation Equipment	20,000	2,000	20	1,780	890	178	89
Shop Tools	2,500	250	20	223	111	22	11
Other Misc. Equipment	3,000	300	20	267	134	27	13
Total Machinery Investment	\$143,000			\$17,595	\$8,797	\$1,759	\$880

Salvage Value=10 Percent of Purchase Value

Annual Cost=((Purchase Price-Salvage Value)/Years of Life)+((Purchase Price+Salvage Value)/2)*Interest Rate

Costs and Returns

The annual budgets in Tables 2-7 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 \$3,855.79 per acre. This cost could rise to nearly \$5,000 per acre for high-density plantings.

Tables 3 through 6 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 4 and in year 8 the orchard begins generating a positive accumulated cash flow.

Table 7 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 Orchard Establishment and Year 1 Production Expenses

Operation	Units	Unit Cost	Units Per Acre	Cost Per Acre	Month	Your Estimate
<u>Site Preparation</u>						
Deep Ripping (custom)	acre	150.00	1	150.00	Sept	
Plow (Labor)	hrs.	9.00	1.5	13.50	Oct	
Disc (Labor)	hrs.	9.00	3.75	33.75	Oct/Mar	
Soil Sample	samples	28.00	3	84.00	Fall	
Float/Landplane(custom)	acre	10.00	1	10.00	April	
<u>Orchard Layout and Planting</u>						
Trees	trees	6.50	390	2535.00	April	
Custom Planting	trees	0.40	390	156.00	April	
Trimming & Training Labor	hrs.	8.00	70	560.00	April/May	
<u>Machinery (cash operating)</u>						
Fuel and Lubrication	acre	50.00	1	50.00		
Repairs and Maintenance	acre	30.00	1	30.00		
<u>Pest Control</u>						
<u>Weeds</u>						
Roundup	quarts	6.75	4	27.00	May	
<u>Insects</u>						
Crown Borer- Asana XL+	oz.	0.70	5	3.50	July/Aug	
Labor	hours	8.00	0.5	4.00	July/Aug	
<u>Fertilization</u>						
Ammonium Sulphate	lbs.	0.11	300	33.00	April	
<u>Operating Interest</u>						
1/2 yearly cash expenses	dol	0.09	1844.88	166.04		
Total Year 1: Establishment/Production Expenses				3,855.79		
Cash Inflows From Sales				0.00		
Net - Year 1				(\$3,855.79)		

Table 3: Peach Orchard Production Expenses-Year 2

Operation	Units	Unit Cost	Units Per Acre	Cost Per Acre	Month	Your Estimate
<u>Labor</u>						
Pruning	hrs.	8.00	25	200.00	Jan-Mar	
Prunings Removal	hrs.	8.00	4	32.00	Mar.	
Spraying	hrs.	9.00	3	27.00		
Tillage/Mowing	hrs.	9.00	4	36.00	April-July	
Thinning	hrs.	8.00	0	0.00	April-June	
Irrigation	hrs.	8.00	5	40.00	April-Oct.	
Fertilization	hrs.	8.00	4	32.00	Mar.	
Harvest	hrs.	8.00	0	0.00	July-Oct.	
<u>Machine Costs</u>						
Repairs	acre	150.00	1	150.00		
Fuel & Lube	acre	85.00	1	85.00		
<u>Aphid/Mite Sprays</u>						
Dormant Oil Spray	gal.	3.85	3	11.55	Mar.	
<u>Crown Borer</u>						
Asana XL+	oz.	0.70	10	7.00	Jul & Aug	
<u>Twig Borer</u>						
Imidan 70WP	lbs.	7.25	4	29.00	May & Jul	
<u>Weed Sprays</u>						
Roundup	gal	27.00	1.5	40.50	May	
<u>Powdery Mildew</u>						
Sulfur	lbs.	0.80	10	8.00	Apr-Jun	
Nova	oz.	4.40	5	22.00	Apr-Jun	
<u>Coryneum Blight</u>						
Captan	lbs.	3.50	4	14.00	May	
<u>Fertilizers</u>						
Ammonium Sulphate	lbs.	0.11	300	33.00	April	
Micro Nutrients	acre	50.00	1	50.00	April	
<u>Replanting</u>						
Trees	trees	6.50	20	130.00	April	
Custom Planting	trees	0.40	20	8.00	April	
<u>Irrigation Expenses</u>						
Water	acre	60.00	1	60.00	Apr-Oct	
Irrigation	acre	50.00	1	50.00	Apr-Oct	
<u>Miscellaneous Expenses</u>						
Crop Insurance	acre	0.00	1	0.00		
Utilities	acre	270.00	1	270.00		
Supplies	acre	260.00	1	260.00		
Marketing	lbs.	0.00	0.16	0.00		
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.	0.09	935.03	84.15		
Interest on Year 1 Expenses	dol.	0.09	3855.79	347.02		
Total Year 2: Production Expenses				2,301.22		
Cash Inflows From Sales		0.00	0	0.00		
Net - Year 2				-2,301.22		
Total Accumulated Net Returns				(\$6,157.01)		

Table 4: Peach Orchard Production Expenses-Year 3

Operation	Units	Unit Cost	Units Per Acre	Cost Per Acre	Month	Your Estimate
<u>Labor</u>						
Pruning	hrs.	8.00	35	280.00	Jan-Mar	
Prunings Removal	hrs.	8.00	6	48.00	Mar.	
Spraying	hrs.	9.00	3	27.00		
Tillage/Mowing	hrs.	9.00	4	36.00	April-July	
Thinning	hrs.	8.00	0	0.00	April-June	
Irrigation	hrs.	8.00	5	40.00	April-Oct.	
Fertilization	hrs.	8.00	4	32.00	Mar.	
Harvest	hrs.	8.00	0	0.00	July-Oct.	
<u>Machine Costs</u>						
Repairs	acre	150.00	1	150.00		
Fuel & Lube	acre	85.00	1	85.00		
<u>Aphid/Mite Sprays</u>						
Dormant Oil Spray	gal.	3.85	4	15.40	Mar.	
<u>Crown Borer</u>						
Asana XL+	oz.	0.70	10	7.00	Jul & Aug	
<u>Twig Borer</u>						
Imidan 70WP	lbs.	7.25	4	29.00	May & Jul	
<u>Weed Sprays</u>						
Roundup	gal	27.00	1.5	40.50	May	
<u>Powdery Mildew</u>						
Sulfur	lbs.	0.80	10	8.00	Apr-Jun	
Nova	oz.	4.40	5	22.00	Apr-Jun	
<u>Coryneum Blight</u>						
Captan	lbs.	3.50	4	14.00	May	
<u>Fertilizers</u>						
Ammonium Sulphate	lbs.	0.11	300	33.00	April	
Micro Nutrients	acre	50.00	1	50.00	April	
<u>Replanting</u>						
Trees	trees	6.50	5	32.50	April	
Custom Planting	trees	0.40	5	2.00	April	
<u>Irrigation Expenses</u>						
Water	acre	60.00	1	60.00	Apr-Oct	
Irrigation	acre	50.00	1	50.00	Apr-Oct	
<u>Miscellaneous Expenses</u>						
Crop Insurance	acre	0.00	1	0.00		
Utilities	acre	270.00	1	270.00		
Supplies	acre	260.00	1	260.00		
Marketing	acre	0.00	0.16	0.00		
Property Taxes	acre	75.00	1	75.00		
Professional Fees	acre	200.00	1	200.00		
<u>Operating Interest</u>						
1/2 Year 3 Expenses	dol.	0.09	933.20	83.99		
Int. on accrued expenses	dol.	0.09	6157.01	554.13		

Total Year 3: Production Expenses				2,504.52		
Cash Inflows from Sales		0.00	0	0.00		
Net Year 3				-2,504.52		
Total Accumulated Net Returns			\$	(8,661.53)		

Table 5: Peach Orchard Production Expenses-Year 4

Operation	Units	Unit Cost	Units Per Acre	Cost Per Acre	Month	Your Estimate																												
<u>Labor</u>																																		
Pruning	hrs.	8.00	45	360.00	Jan-Mar																													
Prunings Removal	hrs.	8.00	7	56.00	Mar.																													
Spraying	hrs.	9.00	3	27.00																														
Tillage/Mowing	hrs.	9.00	4	36.00	April-July																													
Thinning	hrs.	8.00	50	400.00	April-June																													
Irrigation	hrs.	8.00	5	40.00	April-Oct.																													
Fertilization	hrs.	8.00	4	32.00	Mar.																													
Harvest	hrs.	8.00	30	240.00	July-Oct.																													
<u>Machine Costs</u>																																		
Repairs	acre	150.00	1	150.00																														
Fuel & Lube	acre	85.00	1	85.00																														
<u>Aphid/Mite Sprays</u>																																		
Dormant Oil Spray	gal.	3.85	6	23.10	Mar.																													
<u>Crown Borer</u>																																		
Asana XL+	oz.	0.70	20	14.00	Jul & Aug																													
<u>Twig Borer</u>																																		
Imidan 70WP	lbs.	7.25	4	29.00	May & Jul																													
<u>Weed Sprays</u>																																		
Roundup	gal	27.00	1.5	40.50	May																													
<u>Powdery Mildew</u>																																		
Sulfur	lbs.	0.80	10	8.00	Apr-Jun																													
Nova	oz.	4.40	5	22.00	Apr-Jun																													
<u>Coryneum Blight</u>																																		
Captan	lbs.	3.50	4	14.00	May																													
<u>Fertilizers</u>																																		
Ammonium Sulphate	lbs.	0.11	300	33.00	April																													
Micro Nutrients	acre	50.00	1	50.00	April																													
<u>Replanting</u>																																		
Trees	trees	6.50	0	0.00	April																													
Custom Planting	trees	0.40	0	0.00	April																													
<u>Irrigation Expenses</u>																																		
Water	acre	60.00	1	60.00	Apr-Oct																													
Irrigation	acre	50.00	1	50.00	Apr-Oct																													
<u>Miscellaneous Expenses</u>																																		
Crop Insurance	acre	80.00	1	80.00																														
Utilities	acre	270.00	1	270.00																														
Supplies	acre	260.00	1	260.00																														
Marketing/Packing	lbs.	7800.00	0.15	1170.00																														
Property Taxes	acre	75.00	1	75.00																														
Professional Fees	acre	200.00	1	200.00																														
<u>Operating Interest</u>																																		
1/2 Year 3 Expenses	dol.	0.09	1912.30	172.11																														
Int. on accrued expenses	dol.	0.09	8661.53	779.54																														
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Total Year 4: Production Expenses</td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%; text-align: right;">4,776.24</td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> </tr> <tr> <td>Cash Inflows from Sales</td> <td></td> <td style="text-align: right;">0.55</td> <td style="text-align: right;">6240</td> <td style="text-align: right;">3,432.00</td> <td></td> <td></td> </tr> <tr> <td>Net Year 4</td> <td></td> <td></td> <td></td> <td style="text-align: right;">-1,344.24</td> <td></td> <td></td> </tr> <tr> <td>Total Accumulated Net Returns</td> <td></td> <td></td> <td></td> <td style="text-align: right;">(\$10,005.78)</td> <td></td> <td></td> </tr> </table>							Total Year 4: Production Expenses				4,776.24			Cash Inflows from Sales		0.55	6240	3,432.00			Net Year 4				-1,344.24			Total Accumulated Net Returns				(\$10,005.78)		
Total Year 4: Production Expenses				4,776.24																														
Cash Inflows from Sales		0.55	6240	3,432.00																														
Net Year 4				-1,344.24																														
Total Accumulated Net Returns				(\$10,005.78)																														

Table 6: Peach Orchard Production Expenses-Year 5

Operation	Units	Unit Cost	Units Per Acre	Cost Per Acre	Month	Your Estimate
<u>Labor</u>						
Pruning	hrs.	8.00	50	400.00	Jan-Mar	
Prunings Removal	hrs.	8.00	8	64.00	Mar.	
Spraying	hrs.	9.00	3	27.00		
Tillage/Mowing	hrs.	9.00	4	36.00	April-July	
Thinning	hrs.	8.00	60	480.00	April-June	
Irrigation	hrs.	8.00	5	40.00	April-Oct.	
Fertilization	hrs.	8.00	4	32.00	Mar.	
Harvest	hrs.	8.00	60	480.00	July-Oct.	
<u>Machine Costs</u>						
Repairs	acre	150.00	1	150.00		
Fuel & Lube	acre	85.00	1	85.00		
<u>Aphid/Mite Sprays</u>						
Dormant Oil Spray	gal.	3.85	6	23.10	Mar.	
<u>Crown Borer</u>						
Asana XL+	oz.	0.70	20	14.00	Jul & Aug	
<u>Twig Borer</u>						
Imidan 70WP	lbs.	7.25	4	29.00	May & Jul	
<u>Weed Sprays</u>						
Roundup	gal	27.00	1.5	40.50	May	
<u>Powdery Mildew</u>						
Sulfur	lbs.	0.80	10	8.00	Apr-Jun	
Nova	oz.	4.40	5	22.00	Apr-Jun	
<u>Coryneum Blight</u>						
Captan	lbs.	3.50	4	14.00	May	
<u>Fertilizers</u>						
Ammonium Sulphate	lbs.	0.11	300	33.00	April	
Micro Nutrients	acre	50.00	1	50.00	April	
<u>Replanting</u>						
Trees	trees	6.50	0	0.00	April	
Custom Planting	trees	0.40	0	0.00	April	
<u>Irrigation Expenses</u>						
Water	acre	60.00	1	60.00	Apr-Oct	
Irrigation	acre	50.00	1	50.00	Apr-Oct	
<u>Miscellaneous Expenses</u>						
Crop Insurance	acre	80.00	1	80.00		
Utilities	acre	270.00	1	270.00		
Supplies	acre	260.00	1	260.00		
Marketing	lbs.	15600.00	0.15	2340.00		
Property Taxes	acre	75.00	1	75.00		
Professional Fees	acre	200.00	1	200.00		
<u>Operating Interest</u>						
1/2 Year 5 Expenses	dol.	0.09	965.30	86.88		
Int. on accrued expenses	dol.	0.09	10005.78	900.52		
Total Year 5: Production Expenses						
				6,350.00		
Cash Inflows from Sales		0.55	12480	6,864.00		
Net Year 5				514.00		
Total Accumulated Net Returns				(\$9,491.77)		

Table 7: Peach Orchard Production Expenses-Years 6-20

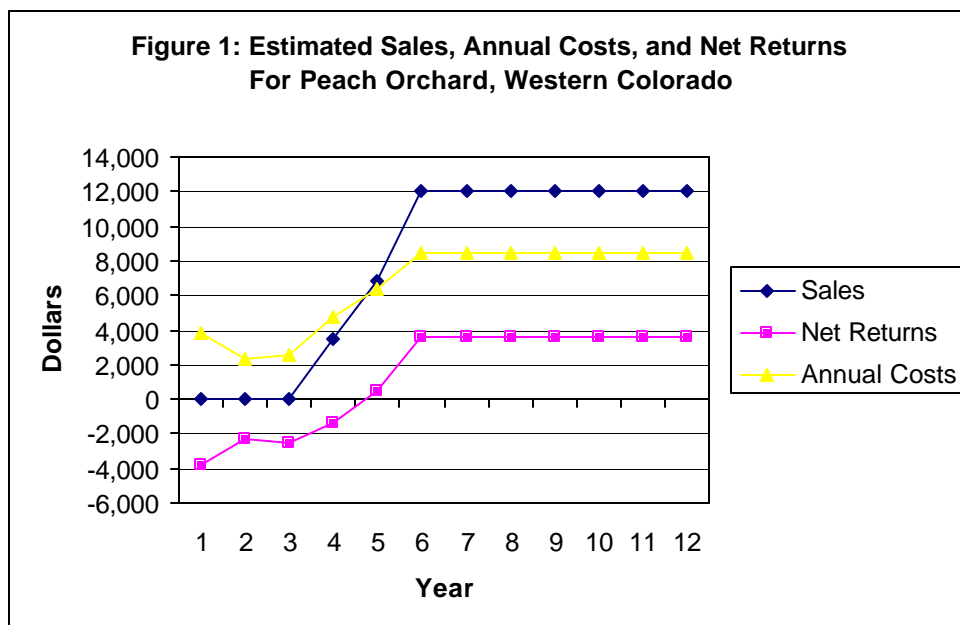
Operation	Units	Unit Cost	Units Per Acre	Cost Per Acre	Month	Your Estimate
<u>Labor</u>						
Pruning	hrs.	8.00	50	400.00	Jan-Mar	
Prunings Removal	hrs.	8.00	8	64.00	Mar.	
Spraying	hrs.	9.00	3	27.00		
Tillage/Mowing	hrs.	9.00	4	36.00	April-July	
Thinning	hrs.	8.00	70	560.00	April-June	
Irrigation	hrs.	8.00	5	40.00	April-Oct.	
Fertilization	hrs.	8.00	4	32.00	Mar.	
Harvest	hrs.	8.00	92	736.00	July-Oct.	
<u>Machine Costs</u>						
Repairs	acre	150.00	1	150.00		
Fuel & Lube	acre	85.00	1	85.00		
<u>Aphid/Mite Sprays</u>						
Dormant Oil Spray	gal.	3.85	6	23.10	Mar.	
<u>Crown Borer</u>						
Asana XL+	oz.	0.70	20	14.00	Jul & Aug	
<u>Twig Borer</u>						
Imidan 70WP	lbs.	7.25	4	29.00	May & Jul	
Roundup	gal	27.00	1.5	40.50	May	
<u>Powdery Mildew</u>						
Sulfur	lbs.	0.80	10	8.00	Apr-Jun	
Nova	oz.	4.40	5	22.00	Apr-Jun	
<u>Coryneum Blight</u>						
Captan	lbs.	3.50	4	14.00	May	
<u>Fertilizers</u>						
Ammonium Sulphate	lbs.	0.11	300	33.00	April	
Micro Nutrients	acre	50.00	1	50.00	April	
<u>Replanting</u>						
Trees	trees	6.50	0	0.00	April	
Custom Planting	trees	0.40	0	0.00	April	
<u>Irrigation Expenses</u>						
Water	acre	60.00	1	60.00	Apr-Oct	
Irrigation	acre	50.00	1	50.00	Apr-Oct	
<u>Miscellaneous Expenses</u>						
Crop Insurance	acre	80.00	1	80.00		
Utilities	acre	270.00	1	270.00		
Supplies	acre	260.00	1	260.00		
Marketing	lbs.	27300.00	0.15	4095.00		
Property Taxes	acre	75.00	1	75.00		
Professional Fees	acre	200.00	1	200.00		
<u>Operating Interest</u>						
1/2 Year 6 Expenses	dol.	0.09	1133.30	102.00		
Int. on accrued expenses	dol.	0.09	9491.77	854.26		
Total Years 6-20: Production Expenses				8,409.86		
Cash Inflows from Sales		0.55	21840	12,012.00		
Net Years 6-20				3,602.14		

Table 7: Continued.

Total Accumulated Net Returns	
Year 6	(\$5,889.63)
Year 7	(\$2,287.49)
Year 8	\$1,314.66
Year 9	\$4,916.80
Year 10	\$8,518.94
Year 11	\$12,121.09
Year 12	\$15,723.23
Year 13	\$19,325.37
Year 14	\$22,927.52
Year 15	\$26,529.66
Year 16	\$30,131.81
Year 17	\$33,733.95
Year 18	\$37,336.09
Year 19	\$40,938.24
Year 20	\$44,540.38

Profitability Without Including Investment 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.



Including the Cost of Establishment and Land

Establishment cost is an investment that takes time to pay off. Annual production is profitable starting in year 5. However, it takes three more years to pay off the accumulated establishment costs. As shown in Table 8, accumulated returns are not positive until year 8. Over twenty years, each acre will accumulate returns of \$44,540 net of production expenses. The present value of this future income, discounted at a 9 percent rate, equals \$10,845. This amount is the maximum investment on top of establishment costs (land, equipment, etc.) this peach enterprise will support. In other words, if you pay \$10,845 per acre today for your land and equipment, you will be earning the same amount over twenty years as you would have by investing in stocks or bonds, for example, that earned 9 percent per year.

Profitability Including Equipment

The maximum investment of \$10,845 per acre has to cover land and 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 \$143,000. Over a twenty-year period, every piece of equipment except for the irrigation, frost control, 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 \$208,868 (143,000 + 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 8, a two-acre orchard would lose \$93,589 per acre and a 10-acre would lose \$10,042 if they purchased the full equipment set we describe in Table 1, before even counting land purchase or preparation costs. There simply are not enough acres to effectively divide the equipment costs. Based on estimated costs and returns, a 20-acre could only afford to pay \$401 per acre.

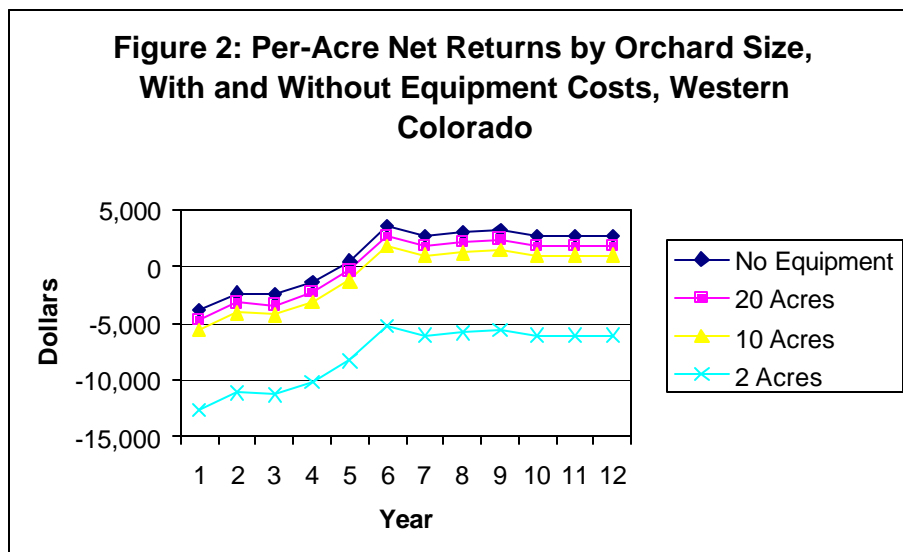


Table 8: Peach Profitability and Price Sensitivity

Year	Production Expenses	Peach Yield lbs./acre	Price: \$0.50 per pound			Price: \$0.55 per pound			Price: \$0.60 per pound		
			Gross Returns	Net Returns	Accumulated Returns	Gross Return	Net Return	Accumulated Returns	Gross Return	Net Return	Accumulated Returns
1	\$3,856	0	\$0	-\$3,856	-\$3,856	\$0	-\$3,856	-\$3,856	\$0.00	-\$3,856	-\$3,856
2	2,301	0	0	-2,301	-6,157	0	-2,301	-6,157	0	-2,301	-6,157
3	2,505	0	0	-2,505	-8,662	0	-2,505	-8,662	0	-2,505	-8,662
4	4,776	6,240	3,120	-1,656	-10,318	3,432	-1,344	-10,006	3,744	-1,032	-9,694
5	6,350	12,480	6,240	-110	-10,428	6,864	514	-9,492	7,488	1,138	-8,556
6	8,410	21,840	10,920	2,510	-7,918	12,012	3,602	-5,890	13,104	4,694	-3,862
7	8,410	21,840	10,920	2,510	-5,407	12,012	3,602	-2,287	13,104	4,694	833
8	8,410	21,840	10,920	2,510	-2,897	12,012	3,602	1,315	13,104	4,694	5,527
9	8,410	21,840	10,920	2,510	-387	12,012	3,602	4,917	13,104	4,694	10,221
10	8,410	21,840	10,920	2,510	2,123	12,012	3,602	8,519	13,104	4,694	14,915
11	8,410	21,840	10,920	2,510	4,633	12,012	3,602	12,121	13,104	4,694	19,609
12	8,410	21,840	10,920	2,510	7,143	12,012	3,602	15,723	13,104	4,694	24,303
13	8,410	21,840	10,920	2,510	9,653	12,012	3,602	19,325	13,104	4,694	28,997
14	8,410	21,840	10,920	2,510	12,164	12,012	3,602	22,928	13,104	4,694	33,692
15	8,410	21,840	10,920	2,510	14,674	12,012	3,602	26,530	13,104	4,694	38,386
16	8,410	21,840	10,920	2,510	17,184	12,012	3,602	30,132	13,104	4,694	43,080
17	8,410	21,840	10,920	2,510	19,694	12,012	3,602	33,734	13,104	4,694	47,774
18	8,410	21,840	10,920	2,510	22,204	12,012	3,602	37,336	13,104	4,694	52,468
19	8,410	21,840	10,920	2,510	24,714	12,012	3,602	40,938	13,104	4,694	57,162
20	8,410	21,840	10,920	2,510	27,224	12,012	3,602	44,540	13,104	4,694	61,856

Maximum Investment (\$/acre)	\$4,497	\$10,845	\$17,192
Maximum Land Investment (\$/acre)			
2 acre orchard	-\$99,936	-\$93,589	-\$87,242
10 acre orchard	-\$16,389	-\$10,042	-\$3,695
20 acre orchard	-\$5,946	\$401	\$6,749

Sensitivity of Results – Factors That Can Change These Results

The results in Table 8 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 8, a reduction in output price from \$0.55 to \$0.50 per pound reduced the investment return from \$10,845 to \$4,497 per acre. An output price increase to \$0.60 per pound hikes income to \$17,192. If prices go up to \$0.60 per pound, you could afford to pay up to \$6,749 per acre for a twenty-acre orchard. 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 a 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 \$10,845 per acre for all investment, or \$17,192 with higher (\$0.60 per pound) market prices. You can determine how much you can afford for equipment by subtracting the land price from these amounts. In our example, you spend \$208,868 in today's dollars for an equipment complement that will last for the next twenty years, counting replacing some pieces. Dividing by 20 acres costs you about \$10,443 per year. If you could set up a cooperative or share the costs with someone else that had 20 acres, for example, your costs would fall to about \$5,222 per acre. If you only had 5 acres, you could cooperatively purchase the equipment with producers that grow on another 35 total acres, and you also would be spending only \$5,222 per acre. Of course the logistics for cooperating or renting equipment would 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 mean higher costs.

As shown in Table 9, 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 9: Maximum Land Investment

	<u>10 Acre Orchard</u>	<u>20 Acre Orchard</u>
Average (Typical) Management	-\$10,042	\$401
Low Cost (Reduced 10%)	-\$4,144	\$6,299
High Yield (Increased 25%)	\$27,079	\$37,522
Low Cost/High Yield	\$32,977	\$43,420

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. The loss is two fold. First, a complete freeze out in year 6 will require another three years before accumulated returns will turn positive. This means that accumulated returns on your establishment and production costs will not be positive until year eleven. Second, the total accumulated return for the 20-year life will be approximately \$21,917 per acre less. 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.

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