



2009 Cost Estimates of Establishing and Producing Gala Apples in Washington

WASHINGTON STATE UNIVERSITY EXTENSION FACT SHEET • FS005E

Preface

Production costs and returns are highly variable for any particular orchard operation due to case-specific:

- Capital, labor, and natural resources
- Type and size of machinery complements
- Cultural practices
- Operation size
- Crop yields
- Input prices
- Commodity prices
- Management skills

Cost estimation also varies with the intended use of the enterprise budget itself. The information in this publication serves as a general guide for establishing and producing Gala apples in the state of Washington. To avoid drawing unwarranted conclusions for any particular orchard or group of orchards, the reader must closely examine the assumptions used and make adjustments in the costs and/or returns as appropriate for their situation.

Gala Apple Production in Washington

Since the first commercial plantings of Gala apples in the 1980s, the popularity of this cultivar has grown exponentially. Production of Gala apples in the United States was motivated by a desire to create export market opportunities, especially in East Asia, where the variety is very popular (Economic Research Service, 2005). Subsequent imports of lower-priced apples from China and other Asian markets, as well as rapid expansion of acres, forced U.S. apple growers to also market these varieties domestically.

Bearing acres of Gala rootstock in Washington State have increased substantially from 230 acres planted in 1986 to 27,807 total bearing acres in 2006. That acreage is distributed across the state as follows: 41 percent in the Yakima District, 32 percent in the Columbia Basin, 23 percent in the Wenatchee Valley, and 3 percent in other areas (National Agricultural Statistics Service, n.d.).

Today Gala is the second largest cultivar grown in Washington following the traditional variety, Red Delicious. Gala apple production has accounted for approximately 20 percent of all Washington apple shipments since 2007, as shown in table 1.

Table 1. Washington Apple Production by Variety and Year^{1, 2, 3}

	2007	2008	2009
Red Delicious	35,913	33,002	33,930
Gala	15,890	18,886	20,327
Granny Smith	14,246	12,849	14,578
Fuji	12,560	12,127	14,962
Golden Delicious	10,403	10,595	12,740
Other	2,338	3,280	3,780
Braeburn	3,525	3,373	3,295
Cripps Pink	1,907	2,420	2,241
Cameo	1,328	1,225	1,374
Jonagold	1,216	978	1,074
Annual Total	99,326	98,735	108,301

¹ Source: Wenatchee Valley Traffic Association, 2009

² 2007 and 2008 values are final based on shipment reports from the Wenatchee and Yakima districts; 2009 values are estimates as of November 2009.

³ Values are in 1,000 box units.

Study Objectives

The study objectives include estimating 1) the costs of the equipment, materials, supplies, and labor required to establish and maintain a modern Gala apple orchard; and 2) what prices and yields must be obtained to make establishment and production of the orchard a profitable venture.

The data used in this study were obtained from a group of Washington fruit growers who have experience growing Gala apples. Their production practices and requirements for labor, equipment, and supplies are the basis for the assumptions used in this study and represent what this group of fruit growers considers to be the latest developments in apple production methods.

Many factors alter not only establishment and production costs, but also pack-out and returns. Due to the assumptions and sources of information used, the values reported in this study represent what growers can anticipate as their average cost of production over the life of an orchard if nothing goes wrong. However, crop loss should be periodically anticipated. We recommend that individual growers use the blanks provided on the right-hand column of the budget to estimate their own costs and returns.

The primary value of this report is its identification of the typical practices and corresponding costs of a modern, well-managed Gala apple orchard. This publication does not necessarily represent the average grower and is not intended to be a guide to production practices. It does, however, indicate current trends in the industry, and as such, can be helpful in estimating the physical and financial requirements of comparable plantings.

Budget Assumptions

1. The budget and production cost items in tables 3–8 are based on a 45-acre Gala block within a 160-acre orchard. It is assumed that approximately 12% of this block is not used for the direct production of tree fruit, but rather dedicated to roads, a pond, loading area, etc. Therefore, the total productive block area is 40 acres.
2. The irrigation system consists of overhead cooling and under-tree drip sprinklers, with two separate sub-main lines. Water is provided through a public irrigation district.
3. Labor is assumed to be hand and ladder, without use of platforms.
4. The Gala block specifications are listed in table 2.

Table 2. Gala Block Specifications

Architecture	Two-dimensional system (planar canopy), randomly trained with an 18-inch radius from tree center.
In-row spacing	4 feet
Between row spacing	10 feet
Root stock	Dwarf—9 series
Block size	40 acres
Trellis system	Five-wire vertical system. Trellis is 11 feet high, with 12-foot trees. Bottom wire is 18 inches from the ground with 24 inches between each wire.

Summary of Results

The production cost estimates given in this study provide a snapshot of the ever-changing economic conditions that affect Gala apple production. Given the assumptions in this study, the estimated cost of production for a five-year-old Gala block is \$10,757 per acre, as shown in table 3. This estimate includes variable costs such as pruning, chemical application, harvest, and repairs. The fixed cost estimates include depreciation on capital, overhead, and interest to account for the cost of using the orchard’s assets for Gala production as opposed to alternative activities.

Assuming the production practices described previously, the two remaining factors that affect net returns to growers are annual yield and prices received. Alternative production and price scenarios are given in table 4. The different combinations of price and yield levels suggest that years where only price or production are high do not necessarily offer positive net returns. Rather, both factors being at or above the median of the ranges considered in table 4 provide more consistent positive net returns.

Most of the budget values given in table 3 are based on more comprehensive underlying information. Details of the data used to create the budgets for both establishment and full maturity years of production are presented in tables 5 to 8. Annual capital requirements for a 40-acre Gala block are listed in table 5. The detailed machinery and building requirements for the full 160-acre orchard are given in table 6. Interest costs and depreciation are listed in tables 7 and 8, respectively. All interest and amortization costs assume a 7.0 percent interest rate. The amortized establishment costs also assume a total useful life of 15 years (4 years of establishment and 11 years of full production).

An Excel spreadsheet version of the Gala budget, as well as the detailed data tables underlying the per acre cost calculations, are available at <http://www.farm-mgmt.wsu.edu/treefruits.htm>. Growers can use the spreadsheet as a starting point for collecting and analyzing cost data to make informed decisions about cost structures for establishing and producing a Gala apple block.

Table 3. Cost Per Acre of Establishing and Producing Gala Apples on a 40-Acre Orchard Block

	Establishment Years				Full Production Years	Your Costs
	Year 1	Year 2	Year 3	Year 4		
Estimated Production (bins/acre)				35	50	
Estimated Price (\$/bin)				250.00	250.00	
Total Return				8,750.00	12,500.00	
VARIABLE COSTS (\$/acre):						
Establishment						
Soil Preparation	912.00					
Trees (including labor & painting)	7,677.45					
Orchard Activities						
Pruning & Training ¹	210.00	505.00	656.00	1,142.00	1,252.35	
Chemicals & Fertilizer	748.00	548.00	648.00	748.00	900.00	
Beehives				45.00	90.00	
General Farm Labor	500.00	500.00	500.00	500.00	500.00	
Irrigation/Electric Charge	100.00	100.00	100.00	100.00	100.00	
Harvest Activities						
Picking Labor				805.00	1,150.00	
Other Labor (checkers, tractor drivers)				175.00	250.00	
Hauling Apples				210.00	300.00	
Maintenance and Repairs						
Machinery Repair, Fuel & Lube	325.00	325.00	325.00	325.00	325.00	
Irrigation & Pump Repair	70.00	70.00	70.00	70.00	70.00	
Wind Machine & Alarm System Repair				40.00	40.00	
Pond Maintenance				50.00	50.00	
Other Variable Costs						
Crop Insurance					86.52	
Overhead (5% of VC)	527.12	102.40	114.95	210.50	255.69	
Interest (7% of VC) ²	774.87	150.53	168.98	309.44	281.90	
Total Variable Costs	11,844.44	2,300.93	2,582.93	4,729.94	5,651.47	
FIXED COSTS (\$/acre):						
Depreciation						
Trellis	102.40	102.40	102.40	102.40	102.40	
Irrigation System	108.25	108.25	108.25	108.25	108.25	
Mainline & Pump	25.00	25.00	25.00	25.00	25.00	
Wind Machine & Alarm System				102.34	102.34	
Pond				65.88	65.88	
Machinery & Building Annual Replacement Cost	218.75	218.75	218.75	218.75	218.75	
Interest						
Land	525.00	525.00	525.00	525.00	525.00	
Machinery & Buildings	62.32	62.32	62.32	62.32	62.32	
Irrigation System	83.35	83.35	83.35	83.35	83.35	
Wind Machine & Alarm System				98.50	98.50	
Pond				50.72	50.72	
Establishment Cost (7%)		944.62	1,287.31	1,673.73		
Other Fixed Costs						
Land and Property Taxes	75.00	75.00	75.00	75.00	75.00	
Insurance Cost (all farms)	50.00	50.00	50.00	50.00	50.00	
Management Cost	400.00	400.00	400.00	400.00	400.00	
Amortized Establishment Costs					3,138.10	
Total Fixed Costs	1,650.07	2,594.69	2,937.38	3,641.24	5,105.61	
TOTAL COSTS	13,494.52	4,895.62	5,520.31	8,371.17	10,757.08	
ESTIMATED NET RETURNS	-13,494.52	-4,895.62	-5,520.31	378.83	1,742.92	
Accumulated Establishment Costs	13,494.52	18,390.14	23,910.45	23,531.62		

¹Training costs are replaced by green fruit thinning costs in Year 5.

²Interest expense on full year during establishment years and for 3/4 of a year during full production.

Table 4. Estimated Net Returns Per Acre at Various Price and Yield Levels¹

Yield (bins/acre) ²	Price (\$/bin)				
	200	225	250	275	300
35	-3,193.46	-2,318.46	-1,443.46	-568.46	306.54
40	-2,381.33	-1,381.33	-381.33	618.67	1,618.67
45	-1,569.21	-444.21	680.79	1,805.79	2,930.79
50	-757.08	492.92	1,742.92	2,992.92	4,242.92
55	55.05	1,430.05	2,805.05	4,180.05	5,555.05
60	867.18	2,367.18	3,867.18	5,367.18	6,867.18

¹Includes amortized establishment costs.

²Assumes a pack out of 20 fresh packs per bin (all grades) and bin size of 925 pounds.

Table 5. Summary of Annual Capital Requirements for a 40-Acre Gala Block

	Establishment Years				Full Production Year 5
	Year 1	Year 2	Year 3	Year 4	
Annual Requirements					
Land (45.7 acres)	337,500.00				
Trellis System	81,920.00				
Irrigation System	86,600.00				
Mainline & Pump	20,000.00				
Pond				52,700.00	
Wind Machine & Alarm System				102,336.00	
Operating Expenses	494,777.70	113,037.12	124,317.06	210,197.40	247,058.62
Total Requirements	1,020,797.70	113,037.12	124,317.06	365,233.40	247,058.62
Receipts				350,000.00	500,000.00
Net Requirements	1,020,797.70	113,037.12	124,317.06	15,233.40	(252,941.38)

Table 6. Machinery and Building Requirements for a 160-Acre Orchard

	Purchase Price (\$)	Number of Machines	Total Cost (\$)
Mobile Home	80,000	1	80,000
Machine Shop	20,000	1	20,000
Tractor: 70-hp	30,000	2	60,000
Tractor: 30-hp	12,000	1	12,000
4-wheeler	5,000	2	10,000
Speed Sprayer	20,000	2	40,000
Weed Spray Boom & Tank	3,000	1	3,000
Mower	6,000	1	6,000
Fork Lift	20,000	1	20,000
Bin Trailer	4,000	2	8,000
Total Cost			259,000

Table 7. Interest Costs per Acre for a 40-Acre Gala Block

	Total Purchase Price (\$)	Salvage Value (\$)	Number of Acres	Total Interest Cost (\$)	Interest Cost Per Acre (\$)
Land	337,500	337,500	45	23,625	525.00
Machinery & Buildings	259,000	25,900	140	9,972	62.32
Irrigation System	86,600	8,660	40	3,334	83.35
Wind Machine & Alarm System	102,336	10,234	40	3,940	98.50
Pond	52,700	5,270	40	2,029	50.72
Interest Rate	7.0%				
Salvage Value	10.0%				

Table 8. Depreciation Costs per Acre for a 40-Acre Gala Block

	Total Purchase Price (\$)	Number of Acres	Total Value Per Acre (\$)	Years of Use	Depreciation Cost Per Acre (\$)
Trellis	81,920	40	2,048.00	20	102.40
Irrigation System	86,600	40	2,165.00	20	108.25
Mainline & Pump	20,000	40	500.00	20	25.00
Wind Machine & Alarm System	102,336	40	2,558.40	25	102.34
Pond	52,700	40	1,317.50	20	65.88
Machinery & Building Annual Replacement Cost					218.75

Sources

Economic Research Service. 2005. *Fruit and Tree Nuts Outlook*. U.S. Department of Agriculture, FTS-315, March 31. <http://www.ers.usda.gov/publications/fts/mar05/FTS315.pdf>

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