
UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2003

**SAMPLE COSTS TO PRODUCE
PEARS**

Green Bartlett



SACRAMENTO VALLEY
Sacramento County

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INTRODUCTION

Sample costs to produce pears in the Sacramento Valley – Sacramento County are presented in this study. The study is intended as a guide only, and can be used to make production decisions, determine potential returns, prepare budgets and evaluate production loans. Practices described are based on production practices considered typical for the crop and area, but these same practices will not apply to every situation. The sample costs for labor, materials, equipment and custom services are based on current figures. A blank column, “*Your Costs*”, in Tables 1 and 2 is provided for entering your costs.

For an explanation of calculations used for the study refer to the Assumptions or call the Department of Agricultural and Resource Economics, University of California-Davis, (530) 752-3589 or the UC Cooperative Extension Farm Advisor in the county of interest.

Sample cost and return studies for many commodities are available and can be requested through the Department of Agricultural and Resource Economics, UC Davis. Current studies can be downloaded from the department website at <http://coststudies.ucdavis.edu> or obtained from selected county UC Cooperative Extension offices.

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Assumptions

The following assumptions give background information relevant to the values shown in Tables 1 to 6 and pertain to sample costs for producing pears in the Sacramento Valley – Sacramento County. The cultural practices in this study represent typical production practices for this crop and area. The practices and inputs used in this cost study serve as a guide only. All costs and practices may not be applicable to your situation or used during every production year. Cultural practices vary by grower and region and variations can be significant. **Trade names and practices used in this report do not constitute an endorsement or recommendation by the University of California nor is any criticism implied by omission of other similar products or practices.**

Farm. The hypothetical farm located on the valley floor in the Sacramento River Delta - Sacramento County is owned and operated by the owner. The 400 contiguous acre farm consists of 100 acres of pears and 300 acres of row crops. The orchard, established on land previously planted to a pear orchard, is on a loam soil, typical of the region.

Trees. The pear cultivar planted in this study is Green Bartlett on Winter Nellis rootstock, a favorable combination in Sacramento County. Bartlett is a dual-purpose pear, utilized for both fresh market and processing. The trees are planted on 9 X 18-foot spacing, 269 trees per acre. Pear trees have a long production life if they are well maintained. Pear orchards may have some trees over 100 years old still producing a commercial crop. The life of the orchard at the time of planting in this study is estimated to be 100 years.

Production Operating Costs

Replanting. Five trees per acre or 2% of the trees are replanted each year.

Pruning. In this study, a contract labor crew hand prunes during the winter months (December). Prunings are chopped in February during the first mowing.

Irrigation. Growers in the area have riparian rights, however, the growers are members of the North Delta Water Agency, which costs \$1.80 per acre. The main irrigation costs are pumping costs plus irrigation labor. The cost is based on using two 25 - 30 hp motors to pump 30 acre-inches from the river. Price per acre-foot of water will vary by grower in this region depending on power source, power cost, and other irrigation factors. In this study, the power cost is based on grower input costs of \$160 per acre for a mature orchard and at 30 acre-inches calculates to \$5.33 per acre-inch. No assumption is made about effective rainfall or runoff.

Fertilization. Tree nitrogen status is determined during the season by visual observation (shoot vigor and leaf color) and by leaf analysis taken in July. Nitrogen is applied in June and September. In this study, nitrogen as calcium nitrate at 40 pounds of actual N per acre is applied in June and as urea also at 40 pounds of N per acre in September. Sulfate of potash at 200 pounds of K or 400 pounds of material per acre is applied in the fall (September/October). The grower using a tractor and fertilizer spreader makes all fertilizer applications.

Pest Management. The pesticides and rates mentioned in this cost study are listed in *UC Integrated Pest Management Guidelines, Pears*. **Pesticides mentioned in the study are not recommendations, but those commonly used in the region.** For information on other pesticides available, pest identification, monitoring, and management visit the UC IPM website at www.ipm.ucdavis.edu. For information and pesticide use permits, contact the local county agricultural commissioner's office.

Pest Control Adviser (PCA). Written recommendations are required for many pesticides and are made by licensed pest control advisers. In addition, the PCA may monitor the field for agronomic problems including pests and nutrition. Growers can hire private PCA's or receive the service as part of a service agreement with an agricultural chemical and fertilizer company. In this study, the PCA is from an agricultural-chemical company, and a fee is charged for monitoring the pheromone traps.

Weeds. Residual and foliar herbicides (Goal, Karmex, and Roundup) are applied in November along a six-foot strip in the tree row. Two sprays with Roundup and Orchard Master (2-4 D) are applied to the tree rows during the growing season – April and July in this study. The row middles are mowed in February when the prunings are shredded, sprayed with Roundup in February approximately one-week after mowing, sprayed again in April and mowed in August after harvest.

Insects and Mites. Pests treated in this study are codling moth, pear psylla, and mites. All pest management operations are done by the growers with their own equipment.

Codling moth is considered the primary pear pest and its control can affect subsequent control of other pests. Pheromone traps for mating disruption are hung in the orchard in April. The traps are monitored by a PCA. Guthion insecticide is applied in May and Assail in June. Codling moth sprays in the region range from one to three depending on population and year.

Pear psylla is an economically significant insect pear pest. Psylla is controlled with horticultural oil and/or Agri-Mek applied at various times during the year. Treatments made in this study include a dormant spray (oil) in December, delayed dormant spray (Asana and oil) in late February, combination psylla and mites (Agri-Mek and oil) in April. The psylla injects a toxin into the tree, produces honeydew, and vectors the disease pear decline (caused by a mycoplasma) and if severe enough, can lead to yield reductions, smaller fruit size, and loss of tree vigor. Honeydew excreted by psylla can cause russetting on fruit and sooty mold on leaves. Pear decline is not considered a major problem if trees are grafted to a resistant rootstock.

Mites are controlled with the oil in the dormant spray and Thiolutax in the delayed dormant. Control during the season is generally with the April pear psylla treatment where Agri-Mek is applied for both psylla and mites, and the May cover spray where Apollo is added for mites. Some growers using codling moth mating disruption have eliminated in-season psylla and mite sprays. Mites can cause damage in pears even at low levels (two per leaf).

Disease. Twelve treatments for fire blight are made at 3 to 4 day intervals or 2 applications weekly. Blight Ban plus Agrimycin applications are alternated with Mycoshield – one application of each will be applied each week from mid-March through early May. Each application is made to alternate rows and is alternated so that each week both sides of the tree have been sprayed. Pesticides used to control fire blight and other pests are sometimes tank-mixed with other materials. During years of heavy disease pressure, fire blight may require 15 or more pesticide applications. Fire blight symptoms usually appear first in blossom clusters and shoot tips and if left untreated, the infection can move into twigs, stems, and branches. Severe infection may not only cause loss of fruit, but may kill entire branches or trees.

Pear Scab, in this study, is controlled with five fungicide treatments made in the spring prior to infection. The material used in the first treatment is Thiolutax (wetttable sulfur) applied at budbreak (delayed

dormant) in late February (This application is mixed with the Asana for psylla control). Four scab sprays are applied in March and April - Microthiol and Dithane, Ziram and Vangard, Ziram and Flint, Flint and Dithane. Scab sprays are applied to every row. Pear scab is caused by a fungus that first attacks young fruit, appearing as dark velvety spots and often causing the young pears to drop. If fruit does not drop, scabbing and deformities occur and cause reductions in quality. Pear scab can be a serious disease during cool, wet springs.

Vertebrate Pests. The major vertebrate pest in pear orchards for this region is pocket gopher (*Thomomys sp.*). Gophers in this study are managed using poison bait applied in the spring while populations are low. The bait is placed underground in an artificial burrow built by a mechanical bait applicator attached to a tractor. Gophers intersecting the tunnels will explore them and eat the bait. Growers may also use trapping methods.

Growth Regulator. Liqui-Stik, a growth hormone, is applied 5 to 10 days prior to harvest to control pear drop for up to 4 weeks.

Miscellaneous Labor. Labor often called “busy labor” is charged to the crop. To keep a steady labor force, when there are lulls in the crop operation, growers often must keep the laborer working at odd jobs, such as hoeing around shop area, equipment yard and so forth.

Harvest. The crop is harvested with contract labor. Picking, sorting, and packing costs are paid by the grower. The harvest season for Green Bartlett is usually July to early August. The orchard is harvested twice. The first pick is selective and usually collects a third of the fruit, most of which will be sold on the fresh market. The second pick gathers the remaining pears about 10 days or two weeks later. Harvest crews use ladders and picking bags to hand pick fruit that is placed into half-ton field bins on bin trailers. The grower uses four contract crews at ten men each. Each man picks 625 pounds per hour yielding five 1,000-pound bins per eight-hour day. The contractor charges the grower \$17 per bin plus 45% overhead. Each crew has one crew boss, two sorters, and one tractor driver that the grower hires. The tractor driver hauls the filled bins to the packing shed or staging area. The crew boss supervises the picking and moves the picking trailers around, when the tractor driver is hauling the fruit. The grower owns a forklift, rents a forklift and hires two forklift drivers. Two tractors and two bin trailers with four 1,000 pounds bins per trailer are assigned to each crew. The grower uses two of his tractors and rents six for one month. The grower owns the bin trailers and the bins are furnished by the packinghouse. The cost for ladders and picking bags is not included in the harvest costs but as a non-cash overhead investment with all costs charged to the pear orchard. The grower pays the custom hauling costs for fresh market fruit only; the processor pays for the fruit going to processing.

Yields. Typical annual yields for Green Bartlett pears are measured in tons per acre. Yields fall into three categories: fresh market, processed (canning/unrestricted grade), and off-grade (juice/restricted grade). The latter two categories are pears that will not make fresh market grades due to size, appearance or other damage, but can be used for canning or processing into juice, sauce or other processed pear products. Off-grade pears are used in juice, concentrate, fermented products, drying, and frozen goods.

Table A. Sacramento County Yields and Packout for all Pear Varieties and Maturities

Year	Tons/acre	percent of tonnage		
		Fresh	Process	Off-Grade
1997	17.6	14	79	7
1998	23.0	17	78	5
1999	20.8	17	78	5
2000	20.0	21	71	8
2001	17.7	19	79	2
Avg	19.8	18	77	5

Ag Commissioner – Sacramento County

An assumed yield of 20 tons per acre is used to calculate cost per ton. A typical yield range is 15 to 30 tons per acre. Yield maturity is reached in the tenth year. This report separates yields, based on Bartlett grower input, for the three different categories from gross tonnage as follows: fresh market - 30%, processed - 65%, and off-grade - 5%. Culls are not accounted for in this study. Actual tonnage and percent of packout by market categories for all pear varieties and ranges of maturity over the previous five years in Sacramento County is shown in Table A.

Returns. Growers are paid for fruit based on gross field tons for different grades. Estimated net return prices per ton (price received from packer less packing shed costs) for the categories described above are fresh market, \$200; canned, \$220; and juice grade, \$0 (no value). Use of return prices for pears is to calculate a ranging analysis for different yields and prices. Returns may vary during the season and from year to year. The yields and prices used in this cost study are an estimate based on the current markets.

Assessments. Under a state marketing order, mandatory assessment fees are collected and administered by the California Pear Advisory Board (CPAB). This assessment is charged to growers to pay for pest management and registrations, pear marketing and advertising. Rates are set for pears bound for both fresh and processed markets. This report uses CPAB assessments for the categories fresh market carton (36 lb) and processed unrestricted and restricted grades as shown in Table B.

Table B. California Pear Advisory Board Assessments - Bartlett Pears

Category	\$/Unit	Unit
<u>Fresh market</u>		
Tight-fill carton	\$0.300	36 lb
Standard box	\$0.367	45 lb
Metric box	\$0.333	40 lb
LA lug	\$0.192	28 lb
<u>Processed</u>		
Unrestricted grades	\$4.00	ton
Restricted grade	\$1.50	ton
All other special products	\$1.50	ton

Additionally, growers may also pay a voluntary assessment to the California Pear Growers (CPG). The CPG uses these funds to negotiate cannery pricing, lobby for school lunch purchases of canned pears and any other political lobbying which CPAB can't get involved. CPG charges members \$4 per ton of processed fruit.

Pickup/ATV. The pickup is owned by the grower and used for personal and business use. It is assumed that 10,000 miles are for business miles applicable to this orchard. The ATV is used to inspect the orchard, to irrigate and monitor the irrigation system, and other assorted uses.

Labor. Labor rates of \$15.23 per hour for machine operators and \$9.79 for general labor includes payroll overhead of 45%. The basic hourly wages are \$10.50 for machine operators and \$6.75 for general labor. The overhead includes the employers' share of federal and California state payroll taxes, workers' compensation insurance for fruit orchards (code 0016), and a percentage for other possible benefits. Workers' compensation costs will vary among growers, but for this study the cost is based upon the average industry final rate as of January 1, 2003 (California Department of Insurance). Labor for operations involving machinery are 20% higher than the operation time given in Table 1 to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and field repair.

Equipment Operating Costs. Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by ASAE. Fuel and lubrication costs are also determined by ASAE equations based on maximum PTO horsepower, and fuel type. Prices for on-farm delivery of diesel and gasoline are \$1.11 and \$1.58 per gallon, respectively. The fuel prices are a January 2003 average based on four

less than truckload California field delivery locations. The cost includes a 2.25% sales tax (effective September 2001) on diesel fuel and 7.25% sales tax on gasoline. Gasoline also includes federal and state excise tax, which can be refunded for on-farm use when filing your income tax. The fuel, lube, and repair cost per acre for each operation in Table 2 is determined by multiplying the total hourly operating cost in Table 6 for each piece of equipment used for the selected operation by the hours per acre. Tractor time is 10% higher than implement time for a given operation to account for setup, travel and down time.

Interest On Operating Capital. Interest on operating capital is based on cash operating costs and is calculated monthly until harvest at a nominal rate of 7.14% per year. A nominal interest rate is the typical market cost of borrowed funds. The interest cost of post harvest operations is discounted back to the last harvest month using a negative interest charge.

Risk. The risks associated with crop production should not be minimized. While this study makes every effort to model a production system based on typical, real world practices, it cannot fully represent financial, agronomic and market risks, which affect profitability and economic viability.

Cash Overhead

Cash overhead consists of various cash expenses paid out during the year that are assigned to the whole farm and not to a particular operation. These costs include property taxes, interest on operating capital, office expense, liability and property insurance, sanitation services, equipment repairs, and management.

Property Taxes. Counties charge a base property tax rate of 1% on the assessed value of the property. In some counties special assessment districts exist and charge additional taxes on property including equipment, buildings, and improvements. For this study, county taxes are calculated as 1% of the average value of the property. Average value equals new cost plus salvage value divided by 2 on a per acre basis.

Insurance. Insurance for farm investments varies depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.676% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$895 for the entire farm.

Crop Insurance. Crop insurance is available and purchased by most growers. Grower reported costs range from \$35 to \$50 for 65% to 75% multiperil coverage and will pay 65% to 75% of the grower's average production for that field, depending on percent coverage purchased. Hail insurance is also available from private insurers, but is not included as a cost in this study.

Management/Supervisor Wage. Wages of \$67,000 including payroll overhead for the operator grower or farm manager are included as a cost in this study. The cost is allocated by acres to all crops. Returns above costs are also considered a return to management.

Office Expense. Office and business expenses are estimated at \$100 per acre for the entire farm. Estimated costs based on grower input for the pear orchard are \$154 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, tax preparation, legal fees, shop and office utilities, and miscellaneous administrative charges.

Reclamation Fee. The reclamation district manages the water drainage and charges \$30 per acre.

Sanitation Services. Sanitation services provide single portable toilets and washbasin for the orchard and cost the farm \$112 per month. The monthly service charge is an average of four to six California sanitation companies and locations. The cost includes delivery and 8 months of weekly service.

Safety. This includes safety training, record keeping, and safety equipment such as facemasks, goggles, and coveralls. The cost shown is estimated and does not represent costs from any specific data.

Investment Repairs. Annual maintenance on investments (buildings, irrigation system, etc.) is calculated as 2% of the purchase price. A maintenance cost is not included for orchard establishment and land.

Non-Cash Overhead

Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments.

Capital Recovery Costs. Capital recovery cost is the annual depreciation and interest costs for a capital investment. It is the amount of money required each year to recover the difference between the purchase price and salvage value (unrecovered capital). It is equivalent to the annual payment on a loan for the investment with the down payment equal to the discounted salvage value. This is a more complex method of calculating ownership costs than straight-line depreciation and opportunity costs, but more accurately represents the annual costs of ownership because it takes the time value of money into account (Boelje and Eidman). The formula for the calculation of the annual capital recovery costs is $((\text{Purchase Price} - \text{Salvage Value}) \times \text{Capital Recovery Factor}) + (\text{Salvage Value} \times \text{Interest Rate})$.

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery (tractors and implements) the remaining value is a percentage of the new cost of the investment (Boelje and Eidman). The percent remaining value is calculated from equations developed by the American Society of Agricultural Engineers (ASAE) based on equipment type and years of life. The life in years is estimated by dividing the wear out life, as given by ASAE by the annual hours of use in this operation. For other investments including irrigation systems, buildings, and miscellaneous equipment, the value at the end of its useful life is zero. The salvage value for land is the purchase price because land does not depreciate.

Capital Recovery Factor. Capital recovery factor is the amortization factor or annual payment whose present value at compound interest is 1. The amortization factor is a table value that corresponds to the interest rate used and the life of the machine.

Interest Rate. The interest rate of 6.25% used to calculate capital recovery cost is the United States Department of Agriculture-Economic Reporting Service's (USDA-ERS) ten-year average of California's agricultural sector long run rate of return to production assets from current income. It is used to reflect the long-term realized rate of return to these specialized resources that can only be used effectively in the agricultural sector.

Irrigation System. The cost is based on using two 25 - 30 hp motors to pump 30 acre-inches from the river with a lateral flow of 25 to 30 feet. Water is pumped to the orchard after running through a filtration station into an underground, permanent sprinkler system in the tree rows. Because an older orchard was removed at this location, pumps and wells already existed. The cost of the irrigation system is for recasing of

the wells, refurbishing the pumps and motors, installing underground, permanent sprinklers and a new filtration system. The new irrigation system was installed after the orchard had been laid out, but prior to planting. The life of the irrigation system is estimated to be 25 years. The irrigation system is considered an improvement to the property.

Drainage System. Tile drains are installed underground in the field prior to planting.

Fuel Tanks. Two 500-gallon fuel tanks are placed on stands in cement containment meeting Federal, State, and local regulations. Fuel is delivered to the equipment by gravity feed.

Tools. Includes shop tools/equipment, hand tools and field tools such as pruning equipment.

Ladders/Picking Bags. Costs are for 50 picking bags and 50, ten-foot orchard ladders.

Building. The metal shop buildings comprise 2,400 square feet on a cement slab.

Land. Land available for pear production in 2002 ranged from \$4,000 to \$7,200 per acre whereas open land ranged from \$2,000 to \$5,000 per acre according to California Real Estate Appraisers “Trends in Agricultural Land and Lease Values”. Open land available for pear production in this study is valued at \$3,000 per acre as reported by the participating growers.

Establishment Cost. The cost to establish the orchard is used to determine the non-cash overhead expenses: depreciation and interest on investment for the production years. The establishment cost is the sum of cash costs for land preparation, planting, trees, production expenses, and cash overhead for growing pear trees through the first year fruit is harvested minus any returns from production. Establishment costs are taken from the study, *Sample Cost to Establish a Pear Orchard and Produce Pears, Sacramento Valley, 2002*. The Total Accumulated Net Cash Cost in the fifth year represents the establishment cost per acre. For this study, this cost is \$9,052 per acre or \$905,200 for the 100-acre orchard. Establishment cost is depreciated beginning in the sixth year over the remaining 95 years of production.

Equipment. Farm equipment is purchased new or used, but the study shows the current purchase price for new equipment. The new purchase price is adjusted to 60% to indicate a mix of new and used equipment. Equipment costs are composed of three parts: non-cash overhead, cash overhead, and operating costs. Both of the overhead factors have been discussed in previous sections. The operating costs consist of repairs, fuel, and lubrication and are discussed under operating costs.

Table Values. Due to rounding, the totals may be slightly different from the sum of the components.

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UC COOPERATIVE EXTENSION
Table 1. COST PER ACRE TO PRODUCE PEARS
 SACRAMENTO VALLEY - Sacramento County 2003

Operation	Cash and Labor Costs per Acre					Total Cost	Your Cost
	Operation Time (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/Rent		
Cultural:							
Replant Trees - 2%	1.30	13	0	29	0	42	
Prune	0.00	0	0	0	794	794	
Prune: Brush Disposal/Mow Middles	0.40	7	3	0	0	11	
Weed: Mow Middles	0.35	6	3	0	0	9	
Weed: Fall Strip Spray	0.40	7	1	16	0	25	
Weed: Strip Spray (Tree Row) 2X	0.80	15	3	11	0	29	
Weed: Row Middles Spray 2X	0.80	15	3	14	0	31	
Pest: Dormant Spray	0.50	9	5	42	0	56	
Pest: Delay Dormant	0.33	6	3	20	0	29	
Pest: Cut Blight	0.00	0	0	0	300	300	
Pest: Blight Spray 12X	2.00	37	18	175	0	230	
Pest: Scab Spray 4X	1.33	24	11	131	0	167	
Pest: Codling Moth Pheromones	1.25	12	0	127	0	139	
Pest: Cover Spray (CM) 2X (includes mites 1X)	0.67	12	5	117	0	135	
Pest: Psylla & Mite	0.33	6	3	95	0	104	
Pest: Rodent Control	0.20	4	1	7	0	11	
Growth Regulator	0.33	6	3	24	0	33	
Irrigate	5.50	54	0	160	0	214	
Fertilize: Fall, Urea	0.10	2	1	11	0	14	
Fertilize: Fall, Potash	0.10	2	1	66	0	69	
Fertilize: Early Summer, Calcium Nitrate	0.10	2	1	29	0	31	
Fertilize: Leaf Sampling	0.01	0	0	2	0	2	
Miscellaneous Labor	1.00	10	0	0	0	10	
Pickup Truck Use	3.33	61	22	0	0	83	
ATV Use	0.57	10	1	0	0	11	
TOTAL CULTURAL COSTS	21.70	320	89	1,076	1,094	2,577	
Harvest:							
Pick Fruit 2X	10.00	149	10	0	1,041	1,200	
Haul Fruit To Shed (Fresh Only)	0.00	0	0	0	60	60	
TOTAL HARVEST COSTS	10.00	149	10	0	1,101	1,260	
Assessments:							
Assessments	0.00	0	0	209	0	209	
TOTAL ASSESSMENT COSTS	0.00	0	0	209	0	209	
Interest on operating capital @ 7.14%						82	
TOTAL OPERATING COSTS/ACRE		469	98	1286	2,195	4,129	
TOTAL OPERATING COSTS/TON						206	
CASH OVERHEAD:							
Office Expense						154	
Liability Insurance						2	
Sanitation Fees						9	
Reclamation Fee						30	
Crop Insurance						40	
Safety Equipment/Training						10	
Manager/Supervisor						167	
Property Taxes						96	
Property Insurance						45	
Investment Repairs						56	
TOTAL CASH OVERHEAD COSTS						610	
TOTAL CASH COSTS/ACRE						4,739	
TOTAL CASH COSTS/TON						237	

UC COOPERATIVE EXTENSION
Table 1. continued

			Total Cost	Your Cost
NON-CASH OVERHEAD:	Per producing	Annual Cost		
INVESTMENTS	Acre	Capital Recovery		
Building	150	11	11	
Fuel Tanks	9	1	1	
Shop Tools/Hand Tools	30	3	3	
Sprinkler System	2,000	160	160	
Land	3,000	188	188	
Picking Bags	18	4	4	
Ladders	92	13	13	
Orchard Establishment Costs	9,054	568	568	
Spray Mixing Station	18	2	2	
Tile Drainage System	1,000	80	80	
Equipment	685	88	88	
TOTAL NON-CASH OVERHEAD COSTS	16,056	1,118	1,118	
TOTAL COSTS/ACRE			5,856	
TOTAL COSTS/TON			293	

UC COOPERATIVE EXTENSION
Table 2. COSTS AND RETURNS PER ACRE TO PRODUCE PEARS
 SACRAMENTO VALLEY - Sacramento County 2003

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Fresh	6.00	ton	200.00	1,200	
Canned: Processed/Unrestricted	13.00	ton	220.00	2,860	
Juice: Off-Grades/Restricted	1.00	ton	0.00	0	
TOTAL GROSS RETURNS	20.00	ton		4,060	
OPERATING COSTS					
Herbicide:					
Goal 2 XL	0.50	pint	16.68	8	
Karmex DF	1.00	lb	5.59	6	
Roundup Original	2.99	pint	6.83	20	
Orchardmaster	1.50	pint	4.65	7	
Insecticide:					
Supreme Oil	11.00	gal	4.22	46	
Asana XL	8.00	oz	1.04	8	
Agri-Mek	12.00	oz	7.57	91	
Guthion 50W	3.00	lb	12.50	38	
Assail 70WP	2.00	oz	17.00	34	
Apollo	3.00	floz	15.33	46	
Fungicide:					
Thiolux	10.00	lb	0.92	9	
Microthiol	10.00	lb	0.80	8	
Dithane DF Rainshield	8.00	lb	3.50	28	
BlightBan	7.50	oz	8.14	61	
Vanguard WG	4.00	oz	3.99	16	
Ziram	8.00	lb	3.39	27	
Flint	4.00	floz	12.99	52	
Antibiotic:					
Agri-mycin 17	28.80	oz	1.59	46	
Mycoshield	3.00	lb	22.79	68	
Rodenticide:					
Rodent Bait	2.00	lb	3.59	7	
Lures/Confusion:					
Codling Moth Lure	1.00	acre	115.00	115	
Monitoring Fee	1.00	acre	12.00	12	
Adjuvant:					
Sticker	10.00	floz	0.21	2	
Growth Regulator:					
Liqui-Stik	24.00	floz	1.00	24	
Fertilizer:					
Calcium Nitrate (15.5-0-0 21Ca)	40.00	lb N	0.71	29	
LeafAnalysis1/20ac	1.00	acre	1.50	2	
Urea (46-0-0)	40.00	lb N	0.27	11	
Sulfate of Potash	400.00	lb	0.17	66	
Tree:					
Tree - Pear	5.00	each	5.80	29	
Tree Guards	5.00	each	0.07	0	
Irrigation:					
Water - Pumped	30.00	acin	5.33	160	
Assessment:					
CPAB Fresh Market - Tight Fill 36lb	333.00	box	0.30	100	
CPAB Processed - Unrestricted	13.00	ton	4.00	52	
CPAB Processed - Restricted	1.00	ton	1.50	2	
CA Pear Growers Association	14.00	ton	4.00	56	

UC COOPERATIVE EXTENSION
Table 2. continued

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
Rent:					
Forklift	1.00	acre	10.00	10	
Tractors – 6	1.00	acre	45.00	45	
Contract/Custom:					
Harvest – Hand (per 1,000 lb bin)	40.00	bin	17.00	680	
Harvest – Contractor Overhead	40.00	bin	7.65	306	
Harvest – Haul Fresh Fruit	6.00	ton	10.00	60	
Prune	269.00	tree	2.95	794	
Blight Cutting	1.00	acre	300.00	300	
Labor (machine)	18.93	hrs	15.23	288	
Labor (non-machine)	18.44	hrs	9.79	181	
Fuel - Gas	8.71	gal	1.58	14	
Fuel - Diesel	33.64	gal	1.11	37	
Lube				8	
Machinery repair				39	
Interest on operating capital @ 7.14%				82	
TOTAL OPERATING COSTS/ACRE				4,129	
TOTAL OPERATING COSTS/TON				206	
NET RETURNS ABOVE OPERATING COSTS				-69	
CASH OVERHEAD COSTS:					
Office Expense				154	
Liability Insurance				2	
Sanitation Fees				9	
Reclamation Fee				30	
Crop Insurance				40	
Safety Equipment/Training				10	
Manager/Supervisor				167	
Property Taxes				96	
Property Insurance				45	
Investment Repairs (Building, etc.)				56	
TOTAL CASH OVERHEAD COSTS/ACRE				610	
TOTAL CASH COSTS/ACRE				4,739	
TOTAL CASH COSTS/TON				237	
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Building				11	
Fuel Tanks				1	
Shop Tools				3	
Sprinkler Pears				160	
Land				188	
Picking Bags				4	
Ladders				13	
Establishment Costs				568	
Spray Mixing Station				2	
Tile Drainage System				80	
Equipment				88	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				1,118	
TOTAL COSTS/ACRE				5,856	
TOTAL COSTS/TON				293	
NET RETURNS ABOVE TOTAL COST				-1,796	

UC COOPERATIVE EXTENSION
Table 3. MONTHLY CASH COSTS PER ACRE TO PRODUCE PEARS
 SACRAMENTO VALLEY- Sacramento County 2003

Beginning NOV 02	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	TOTAL
Ending OCT 03	02	02	03	03	03	03	03	03	03	03	03	03	
Cultural:													
Weed: Fall Strip Spray	25												25
Pest: Dormant Spray		56											56
Prune: Dormant		794											794
Prune: Mow/Chop Brush				11									11
Weed: Spray Row Middles				15		15							31
Pest: Delay Dormant				29									29
Replant Trees - 2%					42								42
Pest: Blight 12X					77	153							230
Pest: Scab 4X					70	97							167
Irrigate						28	29	57	57	28	14		214
Weed: Strip Spray (Tree Row)						14			14				29
Pest: Rodent						11							11
Pest: Cut Blight						99	99	102					300
Pest: Codling Moth (Pheromones)						139							139
Pest: Psylla and Mites						104							104
Pest: Cover Spray (CM) includes 1X mites							92	43					135
Fertilize: Calcium Nitrate								31					31
Growth Regulator								33					33
Fertilize: Leaf Sampling									2				2
Weed: Mow Middle										9			9
Fertilize: Urea											14		14
Fertilize: Potash											69		69
Miscellaneous Labor	1	1	1	1	1	1	1	1	1	1	1		11
Pickup Truck Use	7	7	7	7	7	7	7	7	7	7	7	7	83
ATV Use	1	1	1	1	1	1	1	1	1	1	1	1	10
TOTAL CULTURAL COSTS	34	859	9	64	198	669	229	275	82	46	106	8	2,577
Harvest:													
Pick Fruit 2X									1,200				1,200
Haul Fresh Fruit To Shed									60				60
Assessments									209				209
TOTAL HARVEST COSTS									1,470				1,470
Interest on operating capital	0	5	5	6	7	11	12	14	23	-1	-1	0	82
TOTAL OPERATING COSTS/ACRE	34	864	14	70	205	680	241	289	1,574	45	105	8	4,129
TOTAL OPERATING COSTS/TON	1.70	43.20	0.70	3.50	10.25	34.00	12.05	14.45	78.70	2.25	5.25	0.40	206
OVERHEAD:													
Office Expense	13	13	13	13	13	13	13	13	13	13	13	13	154
Liability Insurance				2									2
Sanitation Fees	1	1	1	1	1	1	1	1	1	1	1		9
Reclamation Fee	3	3	3	3	3	3	3	3	3	3	3	3	30
Crop Insurance				40									40
Safety Equipment/Training	1	1	1	1	1	1	1	1	1	1	1	1	10
Manager/Supervisor	14	14	14	14	14	14	14	14	14	14	14	14	167
Property Taxes				48					48				96
Property Insurance				22					22				45
Investment Repairs	5	5	5	5	5	5	5	5	5	5	5	5	56
TOTAL CASH OVERHEAD COSTS	37	37	39	147	37	37	37	37	107	37	37	36	610
TOTAL CASH COSTS/ACRE	71	901	53	217	242	717	278	326	1,681	82	142	44	4,739
TOTAL CASH COSTS/TON	3.55	45.05	2.65	10.85	12.10	35.85	13.90	16.30	84.05	4.10	7.10	2.20	237

UC COOPERTIVE EXTENSION
Table 4. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS
 SACRAMENTO VALLEY - Sacramento County 2003

ANNUAL EQUIPMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insur- ance	Taxes		
03 25 HP MFWD Tractor	13,990	15	2,724	1,349	56	84	1,489	
03 55 HP 4WD Tractor	24,051	15	4,682	2,320	97	144	2,561	
03 80 HP 4WD Tractor	47,395	12	11,849	5,039	200	296	5,535	
03 ATV 4WD	7,430	7	2,818	1,010	35	51	1,096	
03 Bait Applicator	1,046	10	185	130	4	6	140	
03 Bin Trailer #1	1,200	15	115	121	4	7	132	
03 Bin Trailer #2	1,200	15	115	121	4	7	132	
03 Bin Trailer #3	1,200	15	115	121	4	7	132	
03 Bin Trailer #4	1,200	15	115	121	4	7	132	
03 Bin Trailer #5	1,200	15	115	121	4	7	132	
03 Bin Trailer #6	1,200	15	115	121	4	7	132	
03 Bin Trailer #7	1,200	15	115	121	4	7	132	
03 Bin Trailer #8	1,200	15	115	121	4	7	132	
03 Forklift-Fieldlift	19,500	20	2,502	1,669	74	110	1,853	
03 Mower - Rotary 9'	4,200	10	743	522	17	25	563	
03 Orchard Sprayer 500 gal #1	19,741	8	4,457	2,764	82	121	2,967	
03 Orchard Sprayer 500 gal #2	19,741	8	4,457	2,764	82	121	2,967	
03 Spreader - Fertilizer	10,725	10	1,897	1,332	43	63	1,438	
03 Pickup 1/2 Ton	26,800	4	13,056	4,805	135	199	5,139	
03 Weed Sprayer 100 G	3,947	5	1,286	716	18	26	760	
TOTAL	208,166		51,576	25,388	875	1,302	27,564	
60% of New Cost *	124,900		30,946	15,233	525	781	16,538	

* Used to reflect a mix of new and used equipment.

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insur- ance	Taxes	Repairs	
Building 2,400 sqft	60,000	30		4,476	203	300	1,200	6,179
Establishment	905,400	95		56,767	3,060	4,527	0	64,354
Fuel Tanks 2-500 g	3,500	25	709	268	14	21	70	373
Ladders (50)	9,179	10		1,262	31	46	184	1,523
Land	1,200,000	95	1,200,000	75,000	0	12,000	0	87,000
Picking Bags (50)	1,838	5		439	6	9	37	492
Shop Tools	12,000	15	1,133	1,208	44	66	240	1,558
Spray Mixing Station	7,223	15	722	725	27	40	144	936
Sprinkler System	200,000	25		16,019	676	1,000	3,973	21,668
Tile Drainage System	400,000	25		32,038	1,352	2,000	4,000	39,390
TOTAL INVESTMENT	2,799,140		1,202,564	188,202	5,413	20,009	9,848	223,473

UC Cooperative Extension
Table 4. continued

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Crop Insurance	100	acre	40.00	4,000
Liability Insurance	400	acre	2.24	896
Manager Wages	400	acre	167.50	67,000
Office Expense	400	acre	100.00	40,000
Reclamation Fee	400	acre	30.00	12,000
Safety Training/Equipment	400	acre	10.00	4,000
Sanitation Fees	100	acre	8.96	896

UC COOPERATIVE EXTENSION
Table 5. HOURLY EQUIPMENT COSTS
SACRAMENTO VALLEY - Sacramento County 2003

Yr Description	COSTS PER HOUR							
	Actual Hours Used	Cash Overhead			Operating			Total Costs/Hr.
		Capital Recovery	Insur- ance	Taxes	Repairs	Fuel & Lube	Total Oper.	
03 25 HP MFWD Tractor	1066.0	0.76	0.03	0.05	0.34	1.57	1.91	2.75
03 55 HP 4WD Tractor	1081.0	1.29	0.05	0.08	0.59	3.45	4.04	5.46
03 80 HP 4WD Tractor	1093.9	2.76	0.11	0.16	0.96	5.01	5.97	9.00
03 ATV 4WD	285.0	2.13	0.07	0.11	0.55	1.21	1.76	4.06
03 Bait Applicator	120.0	0.65	0.02	0.03	0.40	0.00	0.40	1.10
03 Bin Trailer #1	62.5	1.16	0.04	0.06	0.17	0.00	0.17	1.43
03 Bin Trailer #2	62.5	1.16	0.04	0.06	0.17	0.00	0.17	1.43
03 Bin Trailer #3	62.5	1.16	0.04	0.06	0.17	0.00	0.17	1.43
03 Bin Trailer #4	62.5	1.16	0.04	0.06	0.17	0.00	0.17	1.43
03 Bin Trailer #5	62.5	1.16	0.04	0.06	0.17	0.00	0.17	1.43
03 Bin Trailer #6	62.5	1.16	0.04	0.06	0.17	0.00	0.17	1.43
03 Bin Trailer #7	62.5	1.16	0.04	0.06	0.17	0.00	0.17	1.43
03 Bin Trailer #8	62.5	1.16	0.04	0.06	0.17	0.00	0.17	1.43
03 Forklift-Fieldlift	149.7	6.69	0.30	0.44	0.20	3.39	3.59	11.01
03 Mower - Rotary 9'	199.1	1.57	0.05	0.07	2.00	0.00	2.00	3.70
03 Orchard Sprayer 500 gal #1	300.0	5.53	0.16	0.24	3.39	0.00	3.39	9.32
03 Orchard Sprayer 500 gal #2	249.9	6.64	0.20	0.29	3.39	0.00	3.39	10.52
03 Spreader - Fertilizer	120.0	6.66	0.21	0.32	4.11	0.00	4.11	11.30
03 Pickup 1/2 Ton	500.3	5.76	0.16	0.24	2.00	4.54	6.54	12.70
03 Weed Sprayer 100 G	300.0	1.43	0.04	0.05	1.07	0.00	1.07	2.59

UC COOPERATIVE EXTENSION
Table 6. RANGING ANALYSIS
 SACRAMENTO VALLEY – Sacramento County 2003

COSTS PER ACRE AT VARYING YIELD TO PRODUCE PEARS

	YIELD (tons/acre)						
	14.00	16.00	18.00	20.00	22.00	24.00	26.00
OPERATING COSTS/ACRE:							
Cultural Cost	2,577	2,577	2,577	2,577	2,577	2,577	2,577
Harvest Cost	926	1,037	1,149	1,200	1,372	1,483	1,594
Assessment Cost	147	168	188	209	230	251	272
Interest on operating capital	80	80	81	82	83	84	84
TOTAL OPERATING COSTS/ACRE	3,730	3,862	3,995	4,068	4,262	4,395	4,527
Total Operating Cost/ton	266	241	222	203	194	183	174
CASH OVERHEAD COSTS/ACRE							
	609	609	609	610	610	610	610
TOTAL CASH COSTS/ACRE	4,339	4,471	4,604	4,678	4,872	5,005	5,137
Total Cash Costs/ton	310	279	256	234	221	209	198
NON-CASH OVERHEAD COSTS/ACRE							
	1,116	1,117	1,117	1,118	1,118	1,118	1,119
TOTAL COSTS/ACRE	5,455	5,588	5,721	5,796	5,990	6,123	6,256
Total Costs/ton	390	349	318	290	272	255	241

NET RETURNS PER ACRE ABOVE TOTAL OPERATING COSTS

PRICE (\$/ton)			YIELD (tons/acre)						
Fresh:	Processing:	Off-Grades:	4.20	4.80	5.40	6.00	6.60	7.20	7.80
			9.10	10.40	11.70	13.00	14.30	15.60	16.90
			0.70	0.80	0.90	1.00	1.10	1.20	1.30
140.00	154.00	0.00	-1,741	-1,588	-1,437	-1,226	-1,136	-985	-832
160.00	176.00	0.00	-1,456	-1,264	-1,072	-820	-689	-497	-305
180.00	198.00	0.00	-1,172	-939	-706	-414	-243	-10	223
200.00	220.00	0.00	-888	-614	-341	-8	204	477	751
220.00	242.00	0.00	-604	-289	24	398	651	964	1,279
240.00	264.00	0.00	-320	36	390	804	1,097	1,451	1,807
260.00	286.00	0.00	-35	360	755	1,210	1,544	1,939	2,334

NET RETURNS PER ACRE ABOVE TOTAL CASH COSTS

PRICE (\$/ton)			YIELD (tons/acre)						
Fresh:	Processing:	Off-Grades:	4.20	4.80	5.40	6.00	6.60	7.20	7.80
			9.10	10.40	11.70	13.00	14.30	15.60	16.90
			0.70	0.80	0.90	1.00	1.10	1.20	1.30
140.00	154.00	0.00	-2,350	-2,197	-2,046	-1,836	-1,746	-1,595	-1,442
160.00	176.00	0.00	-2,065	-1,873	-1,681	-1,430	-1,299	-1,107	-915
180.00	198.00	0.00	-1,781	-1,548	-1,315	-1,024	-853	-620	-387
200.00	220.00	0.00	-1,497	-1,223	-950	-618	-406	-133	141
220.00	242.00	0.00	-1,213	-898	-585	-212	41	354	669
240.00	264.00	0.00	-929	-573	-219	194	487	841	1,197
260.00	286.00	0.00	-644	-249	146	600	934	1,329	1,724

NET RETURNS PER ACRE ABOVE TOTAL COSTS

PRICE (\$/ton)			YIELD (tons/acre)						
Fresh:	Processing:	Off-Grades:	4.20	4.80	5.40	6.00	6.60	7.20	7.80
			9.10	10.40	11.70	13.00	14.30	15.60	16.90
			0.70	0.80	0.90	1.00	1.10	1.20	1.30
140.00	154.00	0.00	-3,466	-3,314	-3,163	-2,954	-2,864	-2,713	-2,561
160.00	176.00	0.00	-3,181	-2,990	-2,798	-2,548	-2,417	-2,225	-2,034
180.00	198.00	0.00	-2,897	-2,665	-2,432	-2,142	-1,971	-1,738	-1,506
200.00	220.00	0.00	-2,613	-2,340	-2,067	-1,736	-1,524	-1,251	-978
220.00	242.00	0.00	-2,329	-2,015	-1,702	-1,330	-1,077	-764	-450
240.00	264.00	0.00	-2,045	-1,690	-1,336	-924	-631	-277	78
260.00	286.00	0.00	-1,760	-1,366	-971	-518	-184	211	605