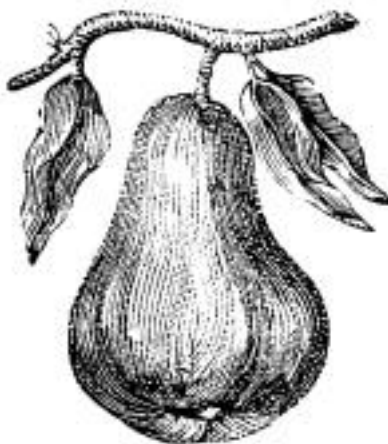

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2002

**SAMPLE COSTS TO ESTABLISH
A PEAR ORCHARD AND PRODUCE**

PEARS

Green Bartlett



SACRAMENTO VALLEY

Sacramento County

Prepared by:

Chuck A. Ingels

UC Cooperative Extension Farm Advisor, Sacramento County

Karen M. Klonsky

UC Cooperative Extension Specialist, Department of Agricultural and Resource Economics, UC Davis

Richard L. De Moura

Research Associate, Department of Agricultural and Resource Economics, UC Davis

Cooperators:

Jim Dahlberg, Pest Control Adviser, Harvey Lyman Co., Walnut Grove

Russell Van Loben Sels, Grower, Courtland

Bruce Wilcox, Grower, Walnut Grove

Thom Wiseman, Pest Control Adviser, John Taylor Fertilizers, Elk Grove

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SACRAMENTO VALLEY - Sacramento County 2002**

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INTRODUCTION

Sample costs to establish an orchard and produce pears in the Sacramento Valley – Sacramento County are presented in this study. This 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 2 and 3 is provided for entering your costs.

The hypothetical farm operation, production practices, overhead, and calculations are described under the assumptions. For additional information or an explanation of the calculations used in the study call the Department of Agricultural and Resource Economics, University of California, Davis, (530) 752-3589 or your local UC Cooperative Extension office.

Sample Cost of Production Studies for many commodities are available and can be requested through the Department of Agricultural and Resource Economics, UC Davis, (530) 752-3589. 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 refer to Tables 1 to 7 and pertain to sample costs to establish a pear orchard and produce pears in the Sacramento Valley – Sacramento County. Practices described are not recommendations by the University of California, but 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 for the production of pears vary by grower and region and variations can be significant. **The use of trade names in this report does not constitute an endorsement or recommendation by the University of California nor is any criticism implied by omission of other similar products.**

Land. The hypothetical farm located on the valley floor in the Sacramento River Delta - Sacramento County is owned, managed and operated by the owner. The 400 contiguous acre farm consists of 100 acres of newly planted pears and 300 acres of row crops. The orchard is located on loam soils typical of the region.

Irrigation. Growers in the area have riparian rights and therefore do not have a water cost. Irrigation costs are pumping cost 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 calculated to cost \$33.00 per acre-foot or \$2.75 per acre-inch. No assumption is made about effective rainfall or runoff. The amount of water applied to the orchard is increased as the orchard matures as shown in Table A.

Table A. Applied Irrigation Water

Year	Water AcIn/Year
1	24
2	24
3	30
4	30
5+	30

Establishment Operating Costs

This orchard is established on ground that has been previously planted to a pear orchard. The land is assumed to be on bottomland with soils that are well drained and fertile. **The growing season in this study is November through October.**

Site Preparation. Orchard removal costs are not included in this study. Preparation begins by spreading lime at two tons per acre. The dealer sells, delivers and spreads the lime. The site is ripped three times to break up underlying hardpan, improve root and water penetration and also pull up additional roots remaining from the previous orchard. The roots are piled and burned. Afterwards the ground is disced twice. The land is laser leveled and disced two more times with the last discing incorporating a preplant herbicide (Prowl). Custom operators do the ripping and laser leveling. All operations that prepare the orchard for planting are done in the year prior to planting, but costs are shown in the first year.

Planting: Planting the orchard starts by laying out and marking tree sites. Holes are dug at each site, trees planted, and tree guards placed around the trunk to protect the trunk from vertebrate, sunburn, and herbicide damage. New trees are cut back soon after planting to encourage scaffold development. In the second year, 5% of the trees or 11 trees per acre are replaced. Tree loss and replacement rate for subsequent years is 2%.

Pruning. Pruning and training begins in the first year during the dormant season (December through February). During the first four years, young trees are trained and pruned to develop a structurally strong framework. Pruning time increases each year until the orchard reaches full production. Prunings are shredded in February during the first mowing.

Fertilization. Nitrogen is the major nutrient required for proper tree growth and optimum yields. In the first four years, 15-15-15 fertilizer is applied by hand near the base of the young tree. Beginning in the fifth year, 40 pounds of N as calcium nitrate (15.5-0-0-21Ca) is applied in the spring. In the fall 40 pounds of N as urea (46-0-0) and 400 pounds of sulfate of potash (0-0-50) are applied in separate applications. Annual rates of applied nutrients are shown in Table B.

Table B. Annual applied nutrients

Year	N	P	K	Ca
lbs/acre				
1	11	11	11	
2	11	11	11	
3	22	22	22	
4	33	33	33	
5	80		200	56
6	80		200	56
7+	80		200	56

Pest Management. The pesticides and rates mentioned in this cost study as well as other materials available are listed in *UC Integrated Pest Management Guidelines, Pears*. Pesticides mentioned in the study are commonly used, but are not necessarily recommendations.

Weeds. The orchard floor is managed by mechanical and/or chemical mowing. Beginning in the first year, the tree rows are sprayed with Roundup and Orchard Master (2-4 D) during the growing season – April and July in this study - and the row middles are mowed four times. In the second year, the row middles are mowed five times; the middles are sprayed with Roundup in February to defer the first mowing until April. In the third and subsequent years, the middles are mowed in February to chop the prunings and then again in late summer, after harvest. They are sprayed with Roundup in February approximately one week after the mowing and again in April. Also, in the third year and subsequent years, a dormant strip spray – Roundup, Goal, Karmex—is applied in November to the tree row.

Insects. Pears have many insect and mite pests: codling moth (*Cydia (Laspeyresia) pomonella*), obliquebanded leafroller (*Choristoneura rosaceana*), pear psylla (*Cacopsylla pyricola*), and several species of mites (*Tetranychus spp.*, *Epitrimerus pyri*, *Phytoptus pyri*, and *Panonychus ulmi*). The pest control sprays are applied with the grower’s tractor and orchard sprayer.

Psylla and mites are controlled with applications of Supreme Oil, beginning in December (dormant spray) of the second year. In February of the fourth year and thereafter, Asana and Thiolux (delayed dormant) are applied for psylla, mites, and scab control. Agrimek and Supreme Oil are applied in April (spring) for psylla and mite control. Mites are also controlled in October with Diazinon and Supreme Oil and in May with Apollo applied with the codling moth cover spray.

Codling moth treatment begins in April of year five by hanging pheromone (Isomate C) mating disruption dispensers (400/acre) in the trees. Guthion is applied at the second peak in May.

Disease. The primary disease in Sacramento County is fire blight (*Erwinia amylovora*), although pear scab (*Venturia pirina*) can be serious in some years. Both diseases occur in the spring.

Fire blight management includes applications of copper dust, antibiotics, and other fungicides; maintaining moderate tree vigor; and/or cutting infected branches. In this study, beginning in the second year,

infected branches are cut from the tree. Beginning in the fourth year, 12 treatments for fire blight are made at 3 to 4 day intervals. Blight Ban plus Agrimycin applications are alternated with Mycoshield – one application of each will be applied each week from mid-March through early May. Pesticides used to control fire blight and other pests are often tank-mixed with other materials. During years of heavy disease pressure, fire blight may require 15 or more pesticide applications resulting in applications at 3 to 4 day spray intervals. Fire blight symptoms usually appear first in blossom clusters and shoot tips and if left untreated, the infection can move into twigs, stem, and branches. Severe infection may not only cause loss of fruit for that year, but may kill entire branches or trees.

Scab treatments are made in March and April beginning in the fourth year at green tip using Microthiol (wetttable sulfur) and Dithane, followed by three applications with the following combinations: Vanguard and Ziram, Flint and Dithane, Flint and Ziram. Scab infects blossoms and leaves in early spring, but generally does not cause significant damage because of dry spring weather in many years and the use of protective sprays. Infected fruit develop an exterior scab that misshapes fruits and renders them unsuitable for fresh market and processing.

Harvest. Commercial harvest often begins in the fourth or fifth year after planting. Some trees will yield fruit in the second or third year, but it is removed so that early tree growth is not stunted. In this study, a commercial crop is produced and harvested in the fifth year. Growers are paid for fruit based on gross field tons for different grades. The crop is harvested using contract labor and hauled by the grower. Four to five year orchards are harvested once and older orchards twice.

Yields. See Table D in Production Operating Costs.

Returns. See Returns in Production Operating Costs.

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.

Fertilization. Tree nitrogen status is determined by visual observation of growth (shoot vigor and leaf color) and validated in July by leaf analysis. Nitrogen is applied in June and September. In this study, June (summer) nitrogen is applied as calcium nitrate at 40 pounds of actual N per acre and in September (fall) as urea also at 40 pounds of N per acre. Sulfate of potash at 200 pounds of K or 400 pounds of material per acre is applied in the fall. 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. Weeds in mature orchards are controlled with most of the same practices as those used in the fifth year. 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 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. A program of mating disruption plus one insecticide treatment, applied at the second peak of the overwintering generation (“1B” peak; usually mid-May) has proven effective for most orchards in this district. However, orchards with high moth populations or those in the first year of mating disruption may require two insecticide applications. In years with very low codling moth populations, some growers have eliminated sprays in most years altogether. Careful monitoring of moth populations and degree-days is essential to determine the need for spraying. The 1B peak insecticide application also helps to control obliquebanded leafrollers (OBLR), however, a spray at the 1A peak (usually mid-April) is more effective for OBLR but less effective for codling moth. If OBLR is the main target an insect growth regulator (IGR) is used.

Pear psylla is the next most economically significant insect pest of pears. Psylla is controlled with horticultural oil and/or Agrimek 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 (Agrimycin and oil) in April. The psylla injects a toxin into the tree, produces honeydew, and vectors the disease pear decline (caused by a mycoplasma). Once in the tissue the toxin causes burning of the foliage, which, 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, reducing photosynthesis. Pear decline is not considered a major problem if trees are grafted to a resistant rootstock, but can result in a loss of vigor.

Mites can cause damage in pears even at low levels (two per leaf). Mites are controlled with the oil in the dormant spray and Thiolux in the delayed dormant spray. Control during the season is generally in conjunction with the April pear psylla treatment where Agrimek is applied for psylla and mites, and the cover spray in May where Apollo is added for mites. However, use of certain insecticides can suppress mite predators and create outbreaks of harmful mites during the growing season. Some growers using codling moth mating disruption have eliminated in-season psylla and mite sprays because the number of applications of disruptive organophosphate insecticides is reduced.

Disease. Fire blight, as described before, can cause the loss of complete branches or trees. Twelve treatments are made weekly with an application of Blight Ban plus Agrimycin, alternated with an application of Mycoshield. These sprays are applied from late March through early May. Several of the blight sprays are combined with scab sprays and with the cover spray if needed. Blight and scab treatments made in March and early April are sprayed every other row. Once foliage gets thicker in mid April, sprays are applied to every row.

Pear Scab, in this study, is controlled with five fungicide treatments made in the spring prior to infection. The materials used in the first treatment are Thiolux (wetable sulfur mixed with Asana for pear psylla control) applied at budbreak in late February. Four scab sprays, combined with fire blight treatments in March and April, are Microthiol and Dithane, Ziram and Vangard, Ziram and Flint, Flint and Dithane. Temperature and moisture monitoring are used to pinpoint timing for fungicide applications. 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. The fruit is unsuitable for the fresh and canning market. 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.

Harvest. The crop is harvested with contract labor and hauled by the grower. Cleaning, 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. Tractors with forklift attachments on both the front loader and 3-point hitch pick up the filled bins, move them from the orchard, and place them on a flatbed truck or drop trailers for transport to a packing shed for cleaning, sorting, and packing.

Yields. Typical annual yields for Green Bartlett pears are measured in tons per acre; Table C indicates the assumed yields for the variety used in this study from the first yield to maturity. Yields fall into three categories: fresh market, processed (canned), and off-grade (juice). The latter two categories are pears that will not make fresh market grades due to cosmetic, size, or other damage factors, but can be used for canning or processing into juice, sauce or other processed pear products. Processed is also referred to as canning or unrestricted grade and off-grade is called restricted grade. Off-grade pears are used in juice, concentrate, fermented products, drying, and frozen goods.

Table C. Annual Yields

Year	Tons/Acre			
	Total	Fresh	Canned	Juice
5	3.0	0.5	2.3	0.2
6	6.0	1.1	4.6	0.3
7	9.0	1.6	6.9	0.5
8	12.0	2.2	9.2	0.6
9	16.0	2.9	12.3	0.8
10+	20.0	3.6	15.4	1.0

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 for the three different categories from gross tonnage as follows: fresh market - 18%, processed - 77%, and off-grade - 5%. Culls are not accounted for in this study. Actual tonnage and percent of packout by various market categories for the previous five years in Sacramento County is shown in Table D.

Table D. Sacramento County Yields and Packout

Year	Tons/acre	percent of tonnage		
		Fresh	Process	Off-grade
1996	14.4	19	76	5
1997	17.6	14	79	7
1998	23.0	17	78	5
1999	20.8	17	78	5
2000	20.0	21	71	8
Avg	19.2	18	77	6

Ag Commissioner – Sacramento County

Returns. Growers are paid for fruit based on gross field tons for different grades. Estimated net return prices per ton for the categories described above are: fresh market - \$235, canned - \$220, and juice grade - \$20. Use of return prices for pears is to calculate 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. Other varieties might reach prices as high as \$600 to \$800 per ton for fresh fruit, but will have very little processing value since they cannot be canned.

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 and processed unrestricted and restricted grades as shown in Table E.

Table E. California Pear Advisory Board Assessments - Bartlett Pears

Category	\$/Unit	Unit
<u>Fresh market</u>		
Tight-fill carton	\$0.300	36 lb
Standard box	\$0.375	45 lb
Metric box	\$0.337	40 lb
LA lug	\$0.193	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 \$2 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 5,000 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. Hourly wages for workers are \$10.50 for machine operators and \$6.75 per hour non-machine labor. Adding 34% for the employers share of federal and state payroll taxes, insurance, and other possible benefits gives the labor rates shown of \$14.07 and \$9.05 per hour for machine labor and non-machine labor, respectively. Labor for operations involving machinery are 20% higher than the operation time given in Table 2 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 \$1.26 and \$1.51 per gallon, respectively. 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 7.40% 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 0.660% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$1,303 for the entire farm.

Management/Supervisor Wage. Wages are not included as a cost in this study. Returns above costs are considered a return to management.

Office Expense. Office and business expenses are estimated at \$40 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, shop and office utilities, and miscellaneous administrative charges.

Reclamation Fee. See Drainage System.

Sanitation Services. Sanitation services provide single portable toilets and washbasin for the orchard and cost the farm \$117 per month. This cost includes delivery and 8 months of weekly service.

Investment Repairs. Annual maintenance is calculated as 2% of the purchase price.

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 (Boehlje 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 (Boehlje 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 6.41% 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. In other words, the next best alternative use for these resources is in another agricultural enterprise.

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. The reclamation district manages the drainage and charges \$30 per acre reclamation fee.

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.

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

Land. Bare land is valued at \$5,000 per acre.

Establishment Cost. The cost to establish the orchard is used to determine the non-cash overhead expenses: depreciation and interest on investment for 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. The *Total Accumulated Net Cash Cost* in the fifth year shown in Table 1 represents the establishment cost per acre. For this study, this cost is \$8,746 per acre or \$874,600 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. SAMPLE COSTS PER ACRE TO ESTABLISH A PEAR ORCHARD
 SACRAMENTO VALLEY – Sacramento County 2002

Year	Cost Per Acre				
	1st	2nd	3rd	4th	5th
Tons Per Acre					3.00
Planting Costs:					
Land Preparation - Lime	74				
Land Preparation - Rip 3X	250				
Land Preparation - Disc 2X	10				
Land Preparation - Leveling	200				
Land Preparation - Disc 1X	5				
Land Preparation - Herbicide	34				
Layout Orchard	18				
Trees: 269 Per Acre (5% in year 2, 2% in year 3+)	1,560	81	23	23	23
Dig, Plant, Wrap, Prune	382	21	6	6	6
TOTAL PLANTING COSTS	2,533	102	29	29	29
Cultural Costs:					
Train & Prune		130	162	546	546
Fertilize (Spring & Fall)	30	30	40	49	102
Weed Control – Spray Row Middles		13	26	26	26
Weed Control - Mow Middles 4X Yr 1, 5X Yr 2, 2X Yr 3+	33	41	17	17	17
Weed Control - In-season Sprays 2X	23	23	23	23	23
Weed Control - Fall Strip Spray			22	22	22
Pest Control - Fall Cleanup Spray				29	29
Pest Control - Dormant Spray		20	26	29	49
Pest Control - Delay Dormant Spray				21	31
Pest Control - Gophers	12	12	12	12	12
Pest Control - Scab Sprays 4X				136	136
Pest Control - Cut Blight		120	120	180	180
Pest Control - Blight 12X				411	411
Pest Control - Pheromone Confusion					138
Pest Control - Cover Spray					80
Pest Control - Psylla & Mite Spray				104	104
Growth Regulator - Hormone Spray					10
Irrigate 6X	71	71	71	88	88
Pickup Truck Use	38	38	38	38	38
ATV Use	11	11	11	11	11
Leaf Analysis					2
TOTAL CULTURAL COSTS	218	509	568	1,742	2,054
Harvest Costs:					
Pick Fruit					157
Haul to Shed					2
TOTAL HARVEST COSTS					159
Assessments:					
California Pear Advisory Board					13
California Pear Growers					6
TOTAL ASSESSMENT COSTS					19
Interest On Operating Capital @ 7.40%	102	22	29	64	69
TOTAL OPERATING COSTS/ACRE	2,853	633	626	1,835	2,330

UC COOPERATIVE EXTENSION

Table 1. continued

Year	Cost Per Acre				
	1st	2nd	3rd	4th	5th
Tons Per Acre					3.00
Cash Overhead Costs:					
Office Expense	40	40	40	40	40
Sanitation Fees	9	9	9	9	9
Liability Insurance	3	3	3	3	3
Reclamation Fee	30	30	30	30	30
Property Taxes	63	63	63	65	65
Property Insurance	9	9	9	10	10
Investment Repairs	64	64	64	64	64
TOTAL CASH OVERHEAD COSTS	218	218	218	221	221
TOTAL CASH COSTS/ACRE	3,071	851	844	2,056	2,551
INCOME/ACRE FROM PRODUCTION					627
NET CASH COSTS/ACRE FOR THE YEAR	3,071	851	844	2,056	1,924
ACCUMULATED NET CASH COSTS/ACRE	3,071	3,922	4,766	6,822	8,746
Capital Recovery Cost:					
Shop Building	11	11	11	11	11
Fuel Tank & Pump	1	1	1	1	1
Shop Tools	3	3	3	3	3
Sprinkler Irrigation System	98	98	98	98	98
Picking Bags					1
Ladders - 10 Each					2
Land	321	321	321	321	321
Spray Mixing Station	2	2	2	2	2
Tile Drainage System	81	81	81	81	81
Equipment	22	21	21	45	53
TOTAL CAPITAL RECOVERY COSTS	539	538	538	562	573
TOTAL COST/ACRE FOR THE YEAR	3,610	1,389	1,382	2,618	3,124
INCOME/ACRE FROM PRODUCTION					627
TOTAL NET COST/ACRE FOR THE YEAR	3,610	1,389	1,382	2,618	2,497
TOTAL ACCUMULATED NET COST/ACRE	3,610	4,999	6,381	8,999	11,496

UC COOPERATIVE EXTENSION
Table 2. COST PER ACRE TO PRODUCE PEARS
 SACRAMENTO VALLEY - Sacramento County 2002

Operation	Operation	Cash and Labor Costs per Acre					Total Cost	Your Cost
	Time (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/Rent			
Cultural:								
Replant Trees - 2%	0.00	0	0	29	0	29		
Plant Trees & Place Guards	1.30	12	0	0	0	12		
Prune	0.00	0	0	0	699	699		
Prune: Brush Disposal/Mow Middles	0.40	7	3	0	0	10		
Weed: Mow Middles Fall	0.33	6	3	0	0	8		
Weed: Fall Strip Spray	0.25	4	2	16	0	22		
Weed: In-season Strip Spray	0.25	4	2	6	0	12		
Weed: Row Middle Spray	0.50	8	3	14	0	26		
Pest: Dormant Spray	0.13	2	1	42	0	45		
Pest: Delay Dormant	0.13	2	1	20	0	23		
Pest: Cut Blight	0.00	0	0	0	300	300		
Pest: Blight & Scab 4X	0.50	8	5	233	0	246		
Pest: Blight Spray 8X	1.83	31	17	234	0	281		
Pest: Codling Moth Pheromone Disruption	1.25	11	0	127	0	138		
Pest: Cover Spray (CM)	0.33	6	3	67	0	76		
Pest: Psylla & Mite	0.33	6	3	95	0	104		
Pest: Rodent Control	0.20	3	1	7	0	12		
Growth Regulator	0.33	6	3	1	0	10		
Irrigate	2.00	18	0	83	0	101		
Fertilize: Fall, Urea/Potash	0.20	3	2	67	0	73		
Fertilize: Early Summer, Calcium Nitrate	1.00	9	0	22	0	31		
Fertilize: Leaf Sampling	0.01	0	0	2	0	2		
Pickup Truck Use	1.67	28	10	0	0	38		
ATV Use	0.57	10	1	0	0	11		
TOTAL CULTURAL COSTS	12.60	186	61	1,069	999	2,316		
Harvest:								
Pick Fruit 1st Pick	0.32	5	2	0	297	297		
Haul Fruit To Shed	1.58	27	21	0	0	47		
Pick Fruit 2nd Pick	0.64	22	8	0	603	632		
TOTAL HARVEST COSTS	2.54	54	31	0	900	1,171		
Assessments:								
California Pear Advisory Board	0.00	0	0	140	0	140		
California Pear Growers Association	0.00	0	0	40	0	40		
TOTAL ASSESSMENT COSTS	0.00	0	0	180	0	180		
Interest on operating capital @ 7.40%						78		
TOTAL OPERATING COSTS/ACRE		245	93	1,249	1,899	3,564		
TOTAL OPERATING COSTS/TON						178		
CASH OVERHEAD:								
Office Expense						40		
Liability Insurance						3		
Sanitation Fees						9		
Reclamation Fee						30		
Property Taxes						109		
Property Insurance						39		
Investment Repairs						64		
TOTAL CASH OVERHEAD COSTS						296		
TOTAL CASH COSTS/ACRE						3,860		
TOTAL CASH COSTS/TON						193		

UC COOPERATIVE EXTENSION
Table 2. continued

			Total Cost	Your Cost
NON-CASH OVERHEAD:				
	Per producing Acre	Annual Cost Capital Recovery		
Investment				
Building 40X60	150	11	11	
Fuel Tanks	9	1	1	
Shop Tools/Hand Tools	30	3	3	
Sprinkler System	1,200	98	98	
Land	5,000	321	321	
Picking Bags	3	1	1	
Ladders - 10 each	14	2	2	
Establishment Costs	8,746	562	562	
Spray Mixing Station	18	2	2	
Tile Drainage System	1,000	81	81	
Equipment	586	69	69	
TOTAL NON-CASH OVERHEAD COSTS	16,756	1,150	1,150	
TOTAL COSTS/ACRE			5,010	
TOTAL COSTS/TON			251	

UC COOPERATIVE EXTENSION
Table 3. COSTS AND RETURNS PER ACRE TO PRODUCE PEARS
 SACRAMENTO VALLEY - Sacramento County 2002

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Fresh	3.60	ton	592.000	846	
Canned: Processed/Unrestricted	15.40	ton	220.000	3,388	
Juice: Off-Grades/Restricted	1.00	ton	20.000	20	
TOTAL GROSS RETURNS	20.00	ton		4,254	
OPERATING COSTS					
Herbicide:					
Goal 2 XL	0.50	pint	16.68	8	
Karmex DF	1.00	lb	5.59	6	
Roundup Ultra	2.66	pint	6.83	18	
Orchardmaster	0.75	pint	4.65	3	
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	2.50	lb	8.60	22	
Fungicide:					
Thiolux	10.00	lb	0.92	9	
Microthiol	10.00	lb	0.80	8	
Dithane F45	5.00	pint	2.55	13	
BlightBan	15.00	oz	8.14	122	
Vangard WG	4.00	oz	3.99	16	
Ziram	8.00	lb	3.39	27	
Flint	4.00	oz	12.99	52	
Antibiotic:					
Agri-mycin 17	57.60	oz	1.59	92	
Mycoshield	6.00	lb	22.79	137	
Miticide:					
Apollo	3.00	oz	15.33	46	
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	oz	0.21	2	
Growth Regulator:					
Liqui-Stik	12.00	oz	0.10	1	
Fertilizer:					
Calcium Nitrate (15.5-0-0 21Ca)	40.00	lb N	0.55	22	
LeafAnalysis1/20ac	1.00	acre	1.50	2	
Urea (46-0-0)	40.00	lb N	0.24	9	
Sulfate of Potash	400.00	lb	0.15	58	
Tree:					
Tree - Pear	5.00	each	5.80	29	
Tree Guards	5.00	each	0.07	0	
Irrigation:					
Water - Pumped	30.00	acin	2.75	83	
Assessment:					
CPAB Fresh Market – Tight Fill 36lb	256.00	Box	0.30	77	
CPAB Processed - Unrestricted	15.40	Ton	4.00	62	
CPAB Processed - Restricted	1.00	Ton	1.50	2	
CA Pear Growers Association	20.00	Ton	2.00	40	

UC COOPERATIVE EXTENSION
Table 3. continued

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
Contract:					
Harvest - Hand	20.00	Ton	45.00	900	
Prune & Train	269.00	tree	2.60	699	
Blight Cutting	1.00	acre	300.00	300	
Labor (machine)	12.53	hrs	14.07	176	
Labor (non-machine)	5.66	hrs	9.05	51	
Fuel - Gas	4.55	gal	1.51	7	
Fuel - Diesel	29.08	gal	1.26	37	
Lube				7	
Machinery repair				36	
Interest on operating capital @ 7.40%				77	
TOTAL OPERATING COSTS/ACRE				3,564	
TOTAL OPERATING COSTS/TON				178	
NET RETURNS ABOVE OPERATING COSTS				690	
CASH OVERHEAD COSTS:					
Office Expense				40	
Liability Insurance				3	
Sanitation Fees				9	
Reclamation Fee				30	
Property Taxes				109	
Property Insurance				39	
Investment Repairs				64	
TOTAL CASH OVERHEAD COSTS/ACRE				296	
TOTAL CASH COSTS/ACRE				3,860	
TOTAL CASH COSTS/TON				193	
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Building 40X60				11	
Fuel Tanks 2-500 g				1	
Shop Tools				3	
Sprinkler Pears				98	
Land				321	
Picking Bags				1	
Ladders - 10 each				2	
Establishment Costs				562	
Spray Mixing Station				2	
Tile Drainage System				81	
Equipment				69	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				1,150	
TOTAL COSTS/ACRE				5,010	
TOTAL COSTS/TON				251	
NET RETURNS ABOVE TOTAL COST				-756	

UC COOPERATIVE EXTENSION
Table 4. MONTHLY CASH COSTS PER ACRE TO PRODUCE PEARS
 SACRAMENTO VALLEY- Sacramento County 2002

Beginning NOV 01	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	TOTAL
Ending OCT 02	01	01	02	02	02	02	02	02	02	02	02	02	
Cultural:													
Weed: Fall Strip Spray	22												22
Pest: Dormant Spray		45											45
Prune: Dormant		699											699
Prune: Mow/Chop Brush				10									10
Weed: Spray Row Middles				13		13							26
Pest: Delay Dormant				23									23
Replant Trees - 2%					29								29
Plant Trees & Place Guard					12								12
Pest: Blight & Scab					113	133							246
Pest: Blight					78	204							281
Irrigate						13	13	27	27	13	8		101
Weed: In-season Strip Spray						12							12
Pest: Rodent						12							12
Pest: Cut Blight						99	99	102					300
Pest: Codling Moth Mating Disruption						138							138
Pest: Psylla and Mites						104							104
Pest: Cover Spray (CM)							76						76
Fertilize: Calcium Nitrate								38					38
Growth Regulator								10					10
Fertilize: Leaf Sampling									2				2
Weed: Mow Middle										8			8
Fertilize: Urea/Potash											73		73
Pickup Truck Use	3	3	3	3	3	3	3	3	3	3	3	3	38
ATV Use	1	1	1	1	1	1	1	1	1	1	1	1	11
TOTAL CULTURAL COSTS	26	749	4	50	236	731	193	181	32	26	85	4	2,316
Harvest:													
Pick Fruit 1st Pick									312				312
Haul Fruit To Shed									47				47
Pick Fruit 2nd Pick									632				632
California Pear Advisory Board									140				140
California Pear Growers Association									40				40
TOTAL HARVEST COSTS									1,171				1,171
Interest on operating capital	0	5	5	5	7	11	12	13	21	-1	-1	0	78
TOTAL OPERATING COSTS/ACRE	26	754	9	55	242	742	205	194	1,224	25	84	4	3,564
TOTAL OPERATING COSTS/TON	1.56	45.15	0.54	3.29	14.49	44.43	12.28	11.62	73.29	1.50	5.03	0.24	178
OVERHEAD:													
Office Expense	3	3	3	3	3	3	3	3	3	3	3	3	40
Liability Insurance			3										3
Sanitation Fees	1	1	1	1	1	1	1	1	1	1	1		9
Reclamation Fee						30							30
Property Taxes				55					55				109
Property Insurance				19					19				39
Investment Repairs	5	5	5	5	5	5	5	5	5	5	5	5	64
TOTAL CASH OVERHEAD COSTS	10	10	13	84	10	40	10	10	84	10	10	9	296
TOTAL CASH COSTS/ACRE	36	763	22	139	252	782	214	203	1,308	34	94	13	3,860
TOTAL CASH COSTS/TON	2.16	45.69	1.32	8.32	15.09	46.83	12.81	12.16	78.32	2.04	5.63	0.78	193

UC COOPERTIVE EXTENSION
Table 5. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS
 SACRAMENTO VALLEY - Sacramento County 2002

ANNUAL EQUIPMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
					Insur- ance	Taxes	
02 3 Point Forks #1	670	15	64	68	2	4	74
02 3 Point Forks #2	670	15	64	68	2	4	74
02 55 HP 2WD Tractor #1	32,269	12	8,068	3,469	133	202	3,804
02 55 HP 2WD Tractor #2	32,269	12	8,068	3,469	133	202	3,804
02 ATV 4WD	7,430	7	2,818	1,019	34	51	1,104
02 Bait Applicator	1,046	10	185	131	4	6	141
02 Loader Forks #1	730	15	70	74	3	4	81
02 Loader Forks #2	730	15	70	74	3	4	81
02 Mower - Rotary 9'	5,400	10	955	677	21	32	730
02 Orchard Sprayer 500 G	19,741	10	3,491	2,475	77	116	2,668
02 Pickup Truck 1/2 Ton	24,500	7	9,294	3,359	112	169	3,640
02 Spreader Fertilizer	9,500	20	495	843	33	50	926
02 Truck - 10 Ton	41,827	10	12,355	4,874	179	271	5,324
02 Weed Sprayer 100 G	3,947	10	698	495	15	23	533
TOTAL	180,729		46,695	21,096	750	1,137	22,984
60% of New Cost *	108,437		28,017	12,658	450	682	13,790

* 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 40X60	60,000	30		4,552	198	300	1,200	6,250
Establishment	874,600	95		56,216	2,886	4,373	0	63,475
Fuel Tanks 2-500 g	3,500	25	709	272	14	21	70	377
Ladders - 10 each	1,400	10	140	184	5	8	28	224
Land	2,000,000	95	2,000,000	128,200	0	20,000	0	148,200
Picking Bags	296	5		71	1	1	0	74
Shop Tools	12,000	15	1,133	1,222	43	66	240	1,571
Spray Mixing Station	7,223	15	722	734	26	40	144	944
Sprinkler System	120,000	25		9,756	396	600	3,973	14,725
Tile Drainage System	100,000	25		8,130	330	500	2,000	10,960
TOTAL INVESTMENT	3,179,019			209,336	3,900	25,909	7,655	246,799

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	400	acre	3.26	1,304
Office Expense	400	acre	40.00	16,000
Reclamation Fee	400	acre	30.00	12,000
Sanitation Fees	100	acre	9.36	936

UC COOPERATIVE EXTENSION
Table 6. HOURLY EQUIPMENT COSTS
 SACRAMENTO VALLEY - Sacramento County 2002

Yr Description	COSTS PER HOUR							Total Costs/Hr.
	Actual Hours Used	Cash Overhead			Operating			
		Capital Recovery	Insur- ance	Taxes	Repairs	Fuel & Lube	Total Oper.	
02 3 Point Forks #1	166.0	0.25	0.01	0.01	0.10	0.00	0.10	0.36
02 3 Point Forks #2	166.0	0.25	0.01	0.01	0.10	0.00	0.10	0.36
02 55 HP 2WD Tractor #1	1001.1	2.08	0.08	0.12	1.43	3.91	5.34	7.62
02 55 HP 2WD Tractor #2	1005.6	2.08	0.08	0.12	1.43	3.91	5.34	7.62
02 ATV 4WD	294.0	2.08	0.07	0.10	0.55	1.16	1.71	3.96
02 Bait Applicator	120.0	0.66	0.02	0.03	0.40	0.00	0.40	1.11
02 Loader Forks	166.0	0.27	0.01	0.01	0.10	0.00	0.10	0.39
02 Loader Forks	166.0	0.27	0.01	0.01	0.10	0.00	0.10	0.39
02 Mower - Rotary 9'	202.7	2.00	0.06	0.09	2.56	0.00	2.56	4.72
02 Orch.Sprayer 500 gal	458.3	3.24	0.10	0.15	3.34	0.00	3.34	6.83
02 Pickup Truck 1/2 Ton	294.7	6.84	0.23	0.34	1.79	4.34	6.13	13.55
02 Spreader Fertilize	69.4	7.29	0.29	0.43	3.48	0.00	3.48	11.49
02 Truck - 10 Ton	214.4	13.64	0.50	0.76	3.99	9.06	13.05	27.95
02 Weed Sprayer 100 Gal	150.0	1.98	0.06	0.09	1.05	0.00	1.05	3.18

UC COOPERATIVE EXTENSION
Table 7. RANGING ANALYSIS
 SACRAMENTO VALLEY – Sacramento County 2002

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	2,316	2,316	2,316	2,316	2,316	2,316	2,316
Harvest Cost	688	799	881	991	1,101	1,184	1,294
Assessment Cost	3,204	3,336	3,434	3,565	3,695	3,794	3,925
Interest on operating capital	229	209	191	178	168	158	151
TOTAL OPERATING COSTS/ACRE	2.50	2.90	3.20	3.60	4.00	4.30	4.70
TOTAL OPERATING COSTS/ton	10.80	12.30	13.90	15.40	16.90	18.50	20.00
CASH OVERHEAD COSTS/ACRE							
TOTAL CASH COSTS/ACRE	2.50	2.90	3.20	3.60	4.00	4.30	4.70
TOTAL CASH COSTS/ton	10.80	12.30	13.90	15.40	16.90	18.50	20.00
NON-CASH OVERHEAD COSTS/ACRE							
TOTAL COSTS/ACRE	2.50	2.90	3.20	3.60	4.00	4.30	4.70
TOTAL COSTS/ton	10.80	12.30	13.90	15.40	16.90	18.50	20.00

UC COOPERATIVE EXTENSION

Table 7. continued

NET RETURNS PER ACRE ABOVE OPERATING COSTS for PEARS

PRICE (\$/ton)			YIELD (tons/acre)						
Fresh	Processing	Off-Grades	2.50	2.90	3.20	3.60	4.00	4.30	4.70
			10.80	12.30	13.90	15.40	16.90	18.50	20.00
			0.70	0.80	0.90	1.00	1.10	1.20	1.30
164.50	154.00	14.00	-1,120	-954	-754	-587	-419	-221	-54
188.00	176.00	16.00	-822	-613	-372	-162	49	290	499
211.50	198.00	18.00	-524	-273	11	264	517	800	1,052
235.00	220.00	20.00	-227	68	394	689	985	1,311	1,606
258.50	242.00	22.00	71	408	777	1,114	1,453	1,821	2,159
282.00	264.00	24.00	369	748	1,160	1,540	1,921	2,331	2,712
305.50	286.00	26.00	667	1,089	1,542	1,965	2,389	2,842	3,265

NET RETURNS PER ACRE ABOVE CASH COSTS for PEARS

PRICE (\$/ton)			YIELD (tons/acre)						
Fresh	Processing	Off-Grades	2.50	2.90	3.20	3.60	4.00	4.30	4.70
			10.80	12.30	13.90	15.40	16.90	18.50	20.00
			0.70	0.80	0.90	1.00	1.10	1.20	1.30
164.50	154.00	14.00	-1,416	-1,250	-1,050	-883	-715	-517	-350
188.00	176.00	16.00	-1,118	-909	-668	-458	-247	-6	203
211.50	198.00	18.00	-820	-569	-285	-32	221	504	756
235.00	220.00	20.00	-523	-229	98	393	689	1,015	1,310
258.50	242.00	22.00	-225	112	481	818	1,157	1,525	1,863
282.00	264.00	24.00	73	452	864	1,244	1,625	2,035	2,416
305.50	286.00	26.00	371	793	1,246	1,669	2,093	2,546	2,969

NET RETURNS PER ACRE ABOVE TOTAL COSTS for PEARS

PRICE (\$/ton)			YIELD (tons/acre)						
Fresh	Processing	Off-Grades	2.50	2.90	3.20	3.60	4.00	4.30	4.70
			10.80	12.30	13.90	15.40	16.90	18.50	20.00
			0.70	0.80	0.90	1.00	1.10	1.20	1.30
164.50	154.00	14.00	-2,563	-2,398	-2,199	-2,033	-1,866	-1,669	-1,502
188.00	176.00	16.00	-2,265	-2,057	-1,817	-1,608	-1,398	-1,158	-949
211.50	198.00	18.00	-1,967	-1,717	-1,434	-1,182	-930	-648	-396
235.00	220.00	20.00	-1,670	-1,377	-1,051	-757	-462	-138	158
258.50	242.00	22.00	-1,372	-1,036	-668	-332	6	373	711
282.00	264.00	24.00	-1,074	-696	-285	94	474	883	1,264
305.50	286.00	26.00	-776	-355	97	519	942	1,394	1,817