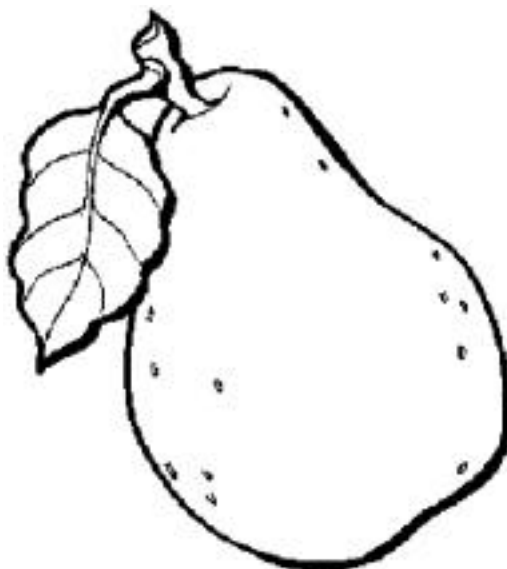

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2002

**SAMPLE COSTS to
ESTABLISH and PRODUCE**

PEARS

Green Bartlett



NORTH COAST REGION

Lake and Mendocino Counties

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UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

SAMPLE COSTS to ESTABLISH and PRODUCE PEARS

Green Bartlett - Sprinkler Irrigated

North Coast Region 2002

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INTRODUCTION

Sample costs to establish a pear orchard and produce Bartlett pears under sprinkler irrigation in the North Coast Region 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 explanation of calculations used in the study call the Department of Agricultural and Resource Economics, University of California, Davis, (530) 752-3589 or the Lake County UC Cooperative Extension office at (707) 263-6838.

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 assumptions refer to Tables 1 to 7 and pertain to sample costs to establish a pear orchard and produce pears in the North Coast Region. Practices described are not University of California recommendations, but represent production practices and materials considered typical of a well-managed orchard in the region. The costs, materials, and practices shown in this study will not be applicable to all situations. Establishment and cultural practices vary by grower and the differences 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.**

Farm. The farm consists of 75 acres of land, 45 acres are producing pear trees, 25 acres are pears being established, and roads, irrigation systems, fencing, and farmstead occupy five acres. The farm is on alluvial bottomland, typical of the North Coast region of Lake and Mendocino Counties.

Trees. The pear cultivar planted in this study is Green Bartlett on Winter Nellis rootstock, a common combination in Lake and Mendocino Counties. Bartlett is a dual-purpose pear, utilized for both fresh market and processing. Six rootstocks are generally used in commercial California orchards. Of these, Winter Nellis is the most favorable for Bartlett planted on sandy loam to loam soils. This rootstock gives uniformity in size and growth as well as better vigor than most rootstocks. The trees are planted on 12' X 20' spacing, 182 trees per acre. Other cultivars grown include Bosc, Red Bartlett, Starkrimson (or Red Clapp) and Comice. Pear trees have a long production life if they are well maintained. Some pear orchards with trees over 100 years old are still producing a commercial crop. The life of the orchard at the time of planting in this study is estimated to be 100 years.

Irrigation. The irrigation cost includes pumped water plus labor. The cost is based on two 25 - 30 hp motors pumping 48 acre-inches from depths of 60 to 90 feet. The water is pumped through a filtration station, then into the underground, permanent, sprinkler system in the tree rows. The prices per acre-foot for water will vary by grower in this region depending on power source, power cost, various well characteristics, and other irrigation factors. In this study, water is calculated to cost \$33.00 per acre-foot (\$2.75/acin). No assumption is made about effective rainfall. The amount of water applied to the orchard increases each year as the trees mature. The average amount of water applied is shown in Table A.

Table A. Applied Irrigation Water			
Year	Irrigation	Frost Protection	Total Water
AcIn/Year			
1	24	0	24
2	24	0	24
3	30	0	30
4	30	0	30
5+	30	18	48

Frost Protection. Protecting the orchard from frost begins in the fifth year when fruit is set. Trees may be protected from low temperatures by wind machines, orchard heaters, and/or sprinkler applied water. Water is sprinkled onto the orchard floor using the existing irrigation system. To protect against frost damage, one acre-inch of water is applied in six hours per night on approximately 18 nights during April and May, however it may begin as early as March and extend into June. The amount of water applied for frost protection is shown in Table A.

Ground covers or resident vegetation cause a cooling affect in the orchard and can increase the chances of frost damage by lowering the orchard temperature. To avoid or reduce injury to the pear buds, spraying with herbicides or mowing during this period should suppress the orchard vegetation. Ground cover, especially grasses can also increase russetting during the early stages of fruit growth.

Orchard Establishment Operating Costs

Site/Land Preparation. Land preparation begins with removing the old orchard. The trees are pushed out with a large bulldozer, piled and burned. The soil is ripped 2 to 3 feet deep. The ripping breaks up underlying hardpan to improve root and water penetration, pulls up roots from the previous orchard that could harbor disease, and opens up the soil profile. Afterwards the ground is disced several times to break up large clods, and smooth the surface. Following discing, the orchard site is fumigated with methyl bromide to control soil-borne pathogens and pests. Contract or custom operators do orchard removal, ripping, and fumigation. The orchard site is sprayed with a contact herbicide and disced prior to planting. All operations that prepare the orchard for planting are done in the summer or fall of 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 with a small stake. Holes are dug at each stake using a tractor mounted posthole digger. Trees are planted, an NPK fertilizer mixture is hand applied around the base of the tree, and a tree guard is placed around the trunk to protect it from vertebrate damage and sunburn. New trees are cut back soon after planting to encourage trunk development. In the second year, 2% of the trees or 4 trees per acre are replaced.

Pruning. Training and pruning begin 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. Pear trees are pruned to a multiple leader system, which reduces the risk of losing a tree to fire blight (*Erwinia amylovora*). Pruning time increases each year until the orchard reaches full production. Prunings are shredded in the spring during a regular mowing.

Fertilization. Nitrogen is the major nutrient required for proper tree growth and optimum yields. In the first three years it is applied by hand at the base of the young tree. In the remaining years granular urea is dissolved in the irrigation water and applied in two irrigations. Annual rates of applied N are shown in Table B.

Year	lbs N/acre	lbs Urea/acre
1	35	76
2	45	98
3	75	163
4 - 6	100	217
7+	200	435

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, Pear*. Pesticides mentioned in the study are commonly used, but are not recommendations.

Weeds. Weed control is important in young orchards so the trees will not be stressed due to competition for water and nutrients. A combination of practices -- discing, cultivation, mowing, and chemical control -- are used to manage the weeds.

Discing is used in this study, although orchard cultivators or other tillage equipment can be used. During the first year the tree rows and middles are disced. In the second year the resident vegetation in the row middles is left to grow and is mowed. Orchard floor vegetation provides several benefits: reduces compaction by equipment, allows equipment access during the winter, improves water infiltration, maintains a habitat for beneficial insects, and lowers dust emissions. Disadvantages are increased risk of frost damage, and competition for nutrients and water.

Chemical weed control in the tree row begins in the fall/winter (November to February) of the first year with a tank mixture of Gramoxone (contact herbicide) and Prowl (pre-emergent herbicide). This combination, also called a dormant strip spray, is applied in the second to fourth years. Beginning in the fifth year, Roundup and Goal are applied to the tree row. In the spring and during the growing season Gramoxone or Roundup is applied.

Insects and Arthropods. Pears have many insect and mite pests: codling moth (*Cydia [Laspeyresia] pomonella*), pear psylla (*Cacopsylla pyricola*), and several species of mites (*Tetranychus spp.*, *Epitrimerus pyri*, *Phytoptus pyri*, and *Panonychus ulmi*). Dormant oil sprays for insects and mites start in the second year and continues throughout the life of the orchard. The spray is targeted at psylla, but also provides some control of aphids, mites and scale. Beginning in the first year of crop set (5th year in this study) additional applications of horticultural oil and other pesticides are added as needed in the delayed dormant and summer periods to control codling moth, pear psylla, mites and other pests. An antibiotic for disease control is mixed with the first cover (codling moth) spray. In the fifth year four cover sprays are applied. The pest control sprays are made with the grower's tractor and orchard sprayer.

Diseases. Many pear diseases can affect pears in the North Coast Region production area, but the two major diseases are pear scab (*Venturia pirina*) and fire blight (*Erwinia amylovora*). Scab can infect blossoms, leaves, and fruit, but generally does not cause significant damage to the blossoms and leaves. The infected fruit develop an exterior scab causing the fruit to be misshapen and unsuitable for fresh market. Disease management begins in the first year of significant crop set with a foliar application of lime sulfur solution and supreme oil at bud break but prior to cluster bud for pear scab and pear psylla control. Three additional scab sprays of Ziram, Flint, or Syllit are made from March through May.

In the spring, fire blight symptoms can appear in blossom clusters and shoot tips. If allowed to begin, the infection can move into twigs, stems, and branches. Severe infections may not only cause loss of fruit for the year, but may kill entire branches or trees. Conditions ideal for rapid fire blight infection and spread are rainy or humid weather following periods of temperatures ranging from 75°F to 85°F. Fire blight management includes applications of copper compounds or antibiotics, avoiding excessive tree vigor, and elimination of infected branches below any visible infection. During years of heavy disease pressure, fire blight may require 10 or more applications of pesticides, which results in 3 to 4 day spray cycles. In this report fire blight treatment begins in the third year with five applications of Kocide, Mycoshield and/or Agri-Mycin. This increases to 12 treatments in the fourth year and continues through the production years. Treatments for fire blight are sometimes mixed with other pest control applications, usually with a scab and a cover spray. Treatments for blight occur during April and May.

Harvest. Pears produce a commercial crop in the fourth or fifth year after planting. Some trees will produce fruit in the second or third year, but is usually 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 and hauled by the grower, although a contracted harvesting company may be hired. Cleaning, sorting, and packing costs are paid by the grower. The harvest season for Green Bartlett in this study is in August. Four and five year old orchards are harvested once, and older pear orchards twice.

Year	Total Yield	Fresh		
		Market	Processed	Off-grade
Tons/Acre				
5	4.0	1.7	1.6	.7
6	7.0	2.9	2.8	1.3
7	10.0	4.2	4.0	1.8
8	13.0	5.5	5.2	2.3
9	16.0	6.7	6.4	2.9
10+	20.0	8.4	8.0	3.6

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, and off-grade. Processed is also referred to as canning or unrestricted grade, and off-grade is called restricted grade. Off-grade pears are used in juice, concentrated, fermented, dried, and frozen products. Pears that go to processing or off-grade receive lower prices than fresh market fruit so grower incentive is to produce for the fresh market although, fresh market prices tend to fluctuate more than processed prices from year to year.

Production Operating Costs

Pruning. In this study, a contract hand crew does pruning in the winter months. Prunings are placed in the row middles and shredded in the spring during the first mowing.

Fertilization. Tree nitrogen status is determined by visual observation (shoot vigor and leaf color) and validated by leaf analysis. Over fertilization of trees can cause excessive shoot growth, which results in increased susceptibility to fire blight, and a reduced fruit set due to shading. Urea at 200 pounds per acre of N is split equally in two applications through the irrigation system in June and in September after harvest.

Pest Management. Pesticides, rates, and cultural practices mentioned in this cost study are a few of those listed in the *UC IPM Pest Management Guidelines, Pear*, and *Integrated Pest Management for Apples and Pears*. For more information on 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 Advisor (PCA). Written recommendations are required for many pesticides and are made by licensed pest control advisors. In addition the PCA will monitor the field for agronomic problems including pests and nutrition. Growers may hire private PCA's or receive the service as part of a service agreement with an agricultural chemical and fertilizer company. The private PCA in this study monitors the field for agronomic problems, pest, and diseases.

Weeds. Weeds in mature orchards are controlled with the same chemical and cultural (mowing) practices as during establishment. Pre-emergent weeds are controlled in the tree row with a dormant strip spray (November to February) of residual and contact herbicides (Goal and Roundup). In this study the strip spray is in December. During the growing season, weeds are controlled with in-season strip sprays of either Roundup or Gramoxone. The orchard floor vegetation in the tree middles is mowed seven times from March through July.

Insects and Arthropods. Several insect and arthropod pests are treated each year. Pests in this study are codling moth, pear psylla, and mites. The grower does all pest management operations with his own equipment.

Codling moth is considered the primary pear pest because it makes fruit unmarketable. Its control largely determines subsequent control of other pests. Since multiple generations occur annually, control with insecticide treatments based on careful monitoring of the population and degree-days is essential. The first generation usually begins hatching in late April or early May; the second and third generations normally occur

in July and August. Guthion is used to control these generations. Additional applications of Guthion or other organophosphates may be required depending on moth populations. In this study, Imidan is applied in July. Treatments for codling moth also help to control other lepidopteran pests such as leaf rollers, but reduce natural enemy populations of mites and pear psylla.

Pear psylla is also a significant insect pest. It injects a toxin into the tree, produces honeydew, and vectors the disease pear decline (caused by a mycoplasma). Pear decline is not considered a major problem if trees are grafted to a resistant rootstock. Toxin from psylla also results in a condition referred to as psylla shock. Once in the tissue, the toxin causes burning of the foliage, which can cause 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. Psylla is primarily controlled with horticultural oil (415 Oil) and Agrimek. Treatments in this study include a dormant spray (Dormant Plus Oil) in January or early February, a delayed dormant spray (415 or 440 Oil) in late February, combination psylla and mite sprays (Oil and Agrimek) in June and July, and a postharvest in September.

Mites can cause damage in pears even at low levels (two per leaf). Dormant oil sprays during the winter control some mites before damage occurs. However, use of certain insecticides can suppress mite predators and create outbreaks of harmful mites during the growing season. Therefore follow up control is needed during the season, generally in conjunction with June and July pear psylla treatments.

Diseases. Fire blight, previously described in the Establishment section, can cause the loss of complete branches or trees. Twelve treatments are made from April through May using an Agri-mycin and Mycoshield tank mix. Two of the blight sprays are combined with other pest applications: one with a scab treatment and one in the first cover spray. Blight sprays that include only antibiotics are made to every other row. The combined blight/scab or cover treatments are applied to every row. The biological control *Pseudomonas fluorescens* A506 (Blight Ban A506) is also used for fire blight as well as a frost and russet management tool by many growers, but is not included in this study.

Pear scab is a serious disease in the cool, moist growing North Coast region. It is 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 causing reductions in quality. In this study, three fungicide treatments are made in the spring prior to infection. Temperature and moisture monitoring are used to pinpoint timing for the fungicide applications. In the first treatment Ziram is applied in March during bud break. Three additional scab sprays (two are combined with fire blight treatments) using Flint, Syllit, or Ziram are made in March, April, and May.

Vertebrate Pests. The major vertebrate pest in pear orchards in the region is pocket gopher (*Thomomys sp.*). Trapping and/or baiting control them. In this study, gophers are managed by applying poison bait in the spring when populations are still low. The bait is placed underground in an artificial burrow made by a mechanical bait applicator and tractor. Gophers intersecting the tunnels will explore them and eat the bait.

Harvest. Mature pear orchards are harvested twice. The first pick in August is selective and usually collects 33% of the fruit, most of which will go for 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. The crop is harvested and hauled by the grower, although a contracted harvesting company may be hired. Cleaning, sorting, and packing costs are paid by the grower.

Yields. Typical annual yields for Green Bartlett pears are measured in tons per acre; Table D shows yields over the past five years. Lake County data was not available for 1998-1999. Yields fall into three categories as shown in Table F: fresh market, processed, and off-grade. Processed is also referred to as canning or unrestricted grade, and off-grade is called restricted grade. Off-grade pears are used in juice, concentrated, fermented, dried, and frozen products. Pears that go to processing or off-grade receive lower prices than fresh market fruit so grower incentive is to produce for the fresh market.

Year	Bartlett Pears	
	Lake	Mendocino
tons/acre		
1996	16.0	24.0
1997	18.3	22.1
1998	N/A	20.6
1999	N/A	22.0
2000	16.5	19.8

An assumed yield of 20 tons per acre is used to calculate returns and cost per ton. A typical yield range is 15 to 35 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, 42%; processed, 40%; and off-grade, 18%. Actual tonnage and percent packout by various market categories for the previous five years in Lake and Mendocino Counties are shown in Table F.

Returns. Gross return prices per ton for the Bartlett Pear categories described above are: fresh market, \$592; processed, \$220; and off grade, \$20. In the previous ten years fresh market prices ranged from \$400 to \$700 per ton, processed from \$170 to \$230, and off-grade from \$25 to \$125. The return prices for pears are used to calculate ranging analysis for different yields and prices. The prices used in this cost study are estimates based on former and current market conditions.

Assessments. Under a state marketing order, mandatory assessment fees are collected and administered by the California Pear Advisory Board (CPAB). The assessment is charged to growers to pay for pear promotion and research. Rates are set for pears bound for both fresh and processed markets. This report uses CPAB assessments for the categories: Fresh Market--tight-fill carton, and Processed--unrestricted, and Processed--restricted grades as shown in Table E.

Category	Unit Price	Unit
<u>Fresh Market</u>		
Tight-fill carton	\$0.300	36 lb
Standard box	\$0.375	44-46 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 pay a voluntary assessment to the California Pear Growers (CPG). The CPG uses these funds to negotiate a price for growers who sell their pears to proprietary processors, and to foster markets for processed pears. CPG charges members \$2 per ton of processed fruit.

Packinghouse. The packinghouse receives the pears delivered by the grower. The fees charged vary by packinghouse and include the sorting, grading, storage, packaging materials and selling costs. Selling costs are F.O.B. packinghouse. In this study 40% of the fresh market pears are hand wrap packed in 40 or 44 pound boxes at a cost of \$7.80 per box and 60% are packed in tight fill 36 pound boxes at \$5.70 per box. The

packinghouse sells the processing pears to the cannery and receives the revenue. The grower receives payment from the packinghouse less packinghouse charges.

Table F. Tonnage and Percent Packout – Lake / Mendocino Counties Bartlett Pears 1997 - 2001¹

Year	Lake County				Mendocino County			
	Tons	Fresh	Process	Off-grade	Tons	Fresh	Process	Off-grade
	%				%			
1997	78,860	37	45	18	53,310	28	57	15
1998 ²	72,787	25	51	24	49,257	16	65	19
1999	82,453	42	40	18	56,427	26	56	18
2000	62,749	46	42	12	47,353	30	50	20
2001 ³	51,737	42	49	9	39,772	32	59	9
Avg	69,717	38	45	16	49,224	26	57	17

¹California Pear Advisory Board Annual Reports 1997 – 2000. Agricultural Commissioner Annual Report, Mendocino County 1996-2000 ²Severe scab year
³2001 Preliminary Report California Pear Advisory Board.

Labor. Hourly wages for workers are

\$9.00 and \$7.25 per hour for machine and non-machine workers, respectively. Adding 34% for the employers share of federal and state payroll taxes, insurance, and other benefits gives the labor rates shown of \$12.06 and \$9.72 per hour for machine labor and non-machine labor, respectively. Labor time 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. Wages for a manager are not included. Returns above total costs are considered a return to management.

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 producing and marketing pears 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 the profitability and economic viability of pear production. When selecting varieties to plant, growers should consider not only whether they can be successfully grown in the North Coast Region, but if there is a market that will bring an adequate return.

Cash Overhead Costs

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, and equipment repairs.

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.

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 rate for borrowed funds.

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 \$504 for the entire farm.

Office Expense. Office and business expenses are estimated at \$44 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, and road maintenance.

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 repairs on investments or capital recovery items that require maintenance are calculated as two percent of the purchase price.

Non-Cash Overhead Costs

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. The purchase price and salvage value for equipment and investments are shown in Table 5.

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 Long Term. The interest rate of 6.41% used to calculate capital recovery cost is the USDA-ERS's 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.

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.

Irrigation System. 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.

Land. Land values in the North Coast Region range from \$6,000 to \$7,000 per acre. Land in this study is valued at \$6,500 per acre or \$6,964 per producing acre.

Establishment Cost. Costs to establish the orchard are used to determine the non-cash overhead expenses, capital recovery, 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 less 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 \$10,024 per acre or \$250,600 for the 25-acre orchard. Establishment cost is amortized 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. Annual ownership costs for equipment and other investments are shown in Tables 3 and 8. 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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REFERENCES

- American Society of Agricultural Engineers (ASAE). 1994. *American Society of Agricultural Engineers Standards Yearbook*. St. Joseph, MI.
- Agricultural Commissioner. *Annual Crop Report, 1996, 1997, 2000*. Agricultural Commissioner. Lake County. Lakeport, CA
- Agricultural Commissioner. *Annual Crop Report, 1996, 1997, 1998, 1999, 2000*. Agricultural Commissioner, Mendocino County. Ukiah, CA
- Boelje, Michael D., and Vernon R. Eidman. 1984. *Farm Management*. John Wiley and Sons. New York, NY
- California Pear Advisory Board. *Annual Reports 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000*. California Pear Advisory Board. Sacramento, CA
- Elkins, Rachel B., Karen M. Klonsky, and Richard L. De Moura. 2000. *Sample Costs to Establish a Pear Orchard and Produce Pears*. Department of Agricultural and Resource Economics, University of California Cooperative Extension. Davis, CA.
- Klonsky, Karen, Rachel Elkins, and Pete Livingston. 1997. *Sample Costs to Establish a Pear Orchard and Produce Pears*. Department of Agricultural and Resource Economics, University of California Cooperative Extension. Davis, CA.
- Statewide IPM Project. 1999. *Integrated Pest Management for Apples and Pears*. Cooperative Extension. University of California, Division of Agriculture and Natural Resources. Oakland, CA. Publication 3340.
- University of California. 2000. "Pear Pest Management Guidelines." In M. L. Flint (ed.) *UC IPM Pest Management Guidelines*. Integrated Pest Management Education and Publications. University of California. Division of Agriculture and Natural Resources. Oakland, CA. Publication 3339.

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UC COOPERATIVE EXTENSION
Table 1. SAMPLE COSTS PER ACRE TO ESTABLISH A PEAR ORCHARD
 NORTH COAST REGION – Lake/Mendocino Counties 2002

Year:	Cost Per Acre					
	1st	2nd	3rd	4th	5th	6th
Tons Per Acre:					4.0	7.0
Planting Costs:						
Remove Old Orchard	375					
Land Preparation - Rip 3X	250					
Land Preparation - Disc 2X	17					
Land Preparation - Fumigate	1,485					
Land Preparation - Apply Herbicide & Disc	17					
Layout Orchard	194					
Auger Tree Holes	137					
Plant Trees	88	3				
Trees: 182 Per Acre @ \$5.80 ea., (2% in 2nd year)	1,056	23				
Tree Guard & NPK Fertilizer	238	4				
Head Back Trees	29	1				
TOTAL PLANTING COSTS	3,886	31	0	0	0	0
Cultural Costs:						
Train Trees	29					
Pruning & Training		87	262	525	700	700
Fertilizer - Nitrogen	9	11	18	23	23	23
Weed Control - Disc 4X	32					
Weed Control - Mow Middles 7X		59	59	59	59	59
Weed Control - Strip Sprays	25	33	33	33	60	60
Pest Control - Dormant Spray		17	50	50	51	51
Pest Control - Delay Dormant Spray					20	20
Pest Control - Gophers	10	10	10	10	10	10
Pest Control - Bud break Spray					21	21
Pest Control - Pear Scab Sprays					30	30
Pest Control - Fire Blight			84	185	185	185
Pest Control - Fire Blight & Pear Scab Sprays					115	117
Pest Control - Cover Sprays, Codling Moth					80	80
Pest Control - Psylla & Mite Sprays					156	156
Pest Control - Codling Moth Traps					2	2
Fruit Sizing - Hormone Spray					34	34
Irrigate	124	124	141	141	119	119
Frost Protection 18X					64	64
PCA Fees			35	35	35	35
Leaf Analysis				16	15	19
Pickup Truck Use	78	78	78	78	78	78
ATV Use	66	66	66	66	61	66
TOTAL CULTURAL COSTS	373	485	836	1,221	1,918	1,929
Harvest Costs:						
Pick Fruit					222	358
Haul to Shed					31	55
Sort/Pack/Store/Sell Fruit					629	1,090
TOTAL HARVEST COSTS					882	1,503
Postharvest:						
Irrigate					22	22
Pest Control - Postharvest Oil					17	17
TOTAL POSTHARVEST COSTS					39	39
Assessments:						
California Pear Advisory Board					33	55
California Pear Growers					4	6
TOTAL ASSESSMENT COSTS					37	61
Interest On Operating Capital @ 7.40%	286	13	22	26	48	55
TOTAL OPERATING COSTS/ACRE	4,545	529	858	1,247	2,924	3,587

UC COOPERATIVE EXTENSION
Table 1. continued

Year:	Cost Per Acre					
	1st	2nd	3rd	4th	5th	6th
Tons Per Acre:					4.0	7.0
Cash Overhead Costs:						
Office Expense	44	44	44	44	44	44
Sanitation Fees	13	13	13	13	13	13
Liability Insurance	7	7	7	7	7	7
Property Taxes	92	89	90	91	93	96
Property Insurance	15	13	14	14	16	17
Investment Repairs	87	87	87	87	87	87
TOTAL CASH OVERHEAD COSTS	258	253	255	256	260	264
TOTAL CASH COSTS/ACRE	4,803	782	1,113	1,503	3,184	3,851
INCOME/ACRE FROM PRODUCTION					1,361	2,382
NET CASH COSTS/ACRE FOR THE YEAR	4,803	782	1,113	1,503	1,823	1,469
ACCUMULATED NET CASH COSTS/ACRE	4,803	5,585	6,698	8,201	10,024	11,493
Capital Recovery Cost: (Non-Cash Overhead)						
Shop Building	58	58	58	58	58	58
Worker Housing	11	11	11	11	11	11
Fuel Tank & Pump	4	4	4	4	4	4
Shop Tools	18	18	18	18	18	18
Sprinkler Irrigation System	154	154	154	154	154	154
Deer Fence - Electric	33	33	33	33	33	33
Ladders - 16 Each					4	4
Land @ \$6,964/Acre	446	446	446	446	446	446
Equipment	102	54	69	81	122	170
TOTAL CAPITAL RECOVERY COSTS	826	778	793	805	850	898
TOTAL COST/ACRE FOR THE YEAR	5,629	1,560	1,906	2,308	4,034	4,749
INCOME/ACRE FROM PRODUCTION					1,361	2,382
TOTAL NET COST/ACRE FOR THE YEAR	5,629	1,560	1,906	2,308	2,673	2,367
TOTAL ACCUMULATED NET COST/ACRE	5,629	7,189	9,095	11,403	14,076	16,443

UC COOPERATIVE EXTENSION
Table 2. COSTS PER ACRE to PRODUCE PEARS
 NORTH COAST REGION - Lake and Mendocino Counties 2002

Operation	Operation	Cash and Labor Cost per acre					Total Cost	Your Cost
	Time (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/Rent			
Cultural:								
Pest Control - Dormant	0.28	4	3	20	0	27		
Pest Control - Delayed Dormant	0.28	4	3	11	0	18		
Weed Control - Strip Spray 3X	0.53	8	4	49	0	60		
Pest Control - Gophers 3X	0.20	3	1	6	0	10		
Weed Control - Mow Middles 7X	2.52	36	67	0	0	59		
Pest Control - Scab	0.55	8	5	54	0	67		
Frost Protection	1.54	15	0	67	0	64		
Pest Control - Blight	1.24	18	11	125	0	154		
Pest Control - Blight & Scab	0.55	8	5	122	0	135		
Prune & Train Trees	0.00	0	0	0	819	819		
Pest Control - Blight & Cover	0.28	4	3	52	0	58		
Pest Control - Cover Spray	0.83	12	8	88	0	108		
Irrigate	3.00	29	0	47	0	76		
Fertilize - Nitrogen	0.00	0	0	22	0	22		
Pest Control - Psylla & Mites	0.83	12	8	184	0	204		
Apply Hormone	0.28	4	3	28	0	34		
PCA Fees	0.00	0	0	0	35	35		
Leaf Analysis	0.00	0	0	0	19	19		
Pickup Truck Use	3.80	55	22	0	0	77		
ATV Use	3.80	55	6	0	0	61		
TOTAL CULTURAL COSTS	20.47	275	103	857	873	2,107		
Harvest:								
Harvest Fruit - 1st Pick	0.32	9	4	0	304	317		
Harvest Fruit - 2nd Pick	0.64	19	8	0	607	634		
Haul To Packinghouse	5.72	83	75	0	0	157		
TOTAL HARVEST COSTS	6.68	111	86	0	911	1,108		
Packing:								
Sort/Pack/Sell Fruit	0.00	0	0	0	3,114	3,114		
TOTAL PACKING COSTS	0.00	0	0	0	3,114	3,114		
Assessment:								
California Pear Advisory Board	0.00	0	0	177	0	177		
California Pear Growers	0.00	0	0	23	0	23		
TOTAL ASSESSMENT COSTS	0.00	0	0	201	0	201		
Postharvest:								
Irrigate	3.00	29	0	35	0	65		
Fertilize - Nitrogen	0.00	0	0	22	0	22		
Pest Control - Psylla & Mites	0.28	4	3	11	0	18		
TOTAL POSTHARVEST COSTS	3.28	33	3	68	0	104		
Interest on operating capital @ 7.40%						98		
TOTAL OPERATING COSTS/ACRE		418	192	1,126	4,898	6,731		
TOTAL OPERATING COSTS/TON						337		

UC COOPERATIVE EXTENSION
Table 2 continued

	Total	Your	
	Cost	Cost	
CASH OVERHEAD:			
Office Expense	44		
Liability Insurance	7		
Sanitation Fee	13		
Property Taxes	146		
Property Insurance	50		
Investment Repairs	77		
TOTAL CASH OVERHEAD COSTS	337		
TOTAL CASH COSTS/ACRE	7,069		
TOTAL CASH COSTS/TON	353		
NON-CASH OVERHEAD:			
	Per producing	Annual Cost	
Investment	Acre	Capital Recovery	
Buildings	638	58	58
Worker Housing	117	11	11
Fuel Tanks –Above Ground	50	4	4
Shop Tools	181	18	18
Sprinkler System	1,894	154	154
Ladders - 16 Each	31	4	4
Land	6,964	446	446
Pear Establishment	10,024	644	644
Equipment	1,762	212	212
TOTAL NON-CASH OVERHEAD COSTS	21,661	1,552	1,552
TOTAL COSTS/ACRE			8,620
TOTAL COSTS/TON			431

UC COOPERATIVE EXTENSION
Table 3. COSTS AND RETURNS PER ACRE to PRODUCE PEARS
 NORTH COAST REGION - 2002

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Fresh	8.40	ton	592.00	4,973	
Processed/Unrestricted	8.00	ton	220.00	1,760	
Off-Grades/Restricted	3.60	ton	20.00	72	
TOTAL GROSS RETURNS	20.00	ton		6,805	
OPERATING COSTS					
Insecticide:					
Dormant Oil Plus	8.00	gal	2.55	20	
415 Oil	11.00	gal	2.80	31	
Guthion 50W	9.00	lb	8.10	73	
Imidan 70WSB	6.00	lb	6.63	40	
Agri-Mek	36.00	oz	4.88	176	
Herbicide:					
Gramoxone Extra	1.00	pint	4.66	5	
Goal 2XL	2.00	pint	15.35	31	
Roundup Ultra	3.00	pint	4.50	14	
Rodenticide:					
Rodent Bait	1.00	lb	5.62	6	
Fungicide:					
Ziram WDG 76	8.00	lb	2.65	21	
Flint	5.00	oz	12.99	65	
Syllit 65W	3.00	lb	11.50	35	
Water:					
Water - Frost Protection	18.00	acin	2.75	49	
Water - Pumped	30.03	acin	2.75	83	
Antibiotic:					
Mycoshield	7.50	lb	18.95	142	
Agri-mycin 17	60.00	oz	1.09	65	
Contract:					
Pruning Crew	182.00	tree	4.50	819	
Hand Pick	20.00	ton	45.00	900	
PCA Fees	1.00	acre	35.00	35	
Leaf Analysis	1.00	acre	18.50	19	
Fertilizer:					
46-0-0 (Urea)	200.00	lb N	0.22	43	
Growth Regulator:					
Fruit Fix 200	24.00	oz	1.15	28	
Rent:					
Forklift Rental	2.00	week	5.63	11	
Custom:					
Pack - Fresh	8.40	ton	326.50	2,743	
Shed Cost - Processed	11.60	ton	32.00	371	
Assessment:					
CA Fresh Advisory Board Fresh Market	467.00	box	0.30	140	
CA Pear Advisory Board Processed - Unrestricted	8.00	ton	4.00	32	
CA Pear Advisory Board Processed - Restricted	3.60	ton	2	5	
CA Pear Growers	11.60	ton	2	23	
Labor (machine)	28.62	hrs	12	345	
Labor (non-machine)	7.54	hrs	10	73	
Fuel - Gas	12.05	gal	2	18	
Fuel - Diesel	67.02	gal	1	84	
Lube				15	
Machinery repair				74	
Interest on operating capital @ 7.40%				98	
TOTAL OPERATING COSTS/ACRE				6,731	
TOTAL OPERATING COSTS/TON				337	
NET RETURNS ABOVE OPERATING COSTS				73	

UC COOPERATIVE EXTENSION
Table 3 continued

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
CASH OVERHEAD COSTS:					
Office Expense				44	
Liability Insurance				7	
Sanitation Fee				13	
Property Taxes				146	
Property Insurance				50	
Investment Repairs				77	
TOTAL CASH OVERHEAD COSTS/ACRE				337	
TOTAL CASH COSTS/ACRE				7,068	
TOTAL CASH COSTS/TON				353	
NON-CASH OVERHEAD COSTS (capital recovery)					
Buildings				58	
Worker Housing				11	
Fuel Tanks & Pumps				4	
Shop Tools				18	
Sprinkler System				154	
Ladders - 16 Each				4	
Land				446	
Pear Establishment				644	
Equipment				212	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				1,551	
TOTAL COSTS/ACRE				8,620	
TOTAL COSTS/TON				431	
NET RETURNS ABOVE TOTAL COSTS				-1815	

U.C. COOPERATIVE EXTENSION
Table 4. MONTHLY CASH COSTS PER ACRE to PRODUCE PEARS
 NORTH COAST REGION - Lake and Mendocino Counties 2002

Beginning JAN 02	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Ending DEC 02	02	02	02	02	02	02	02	02	02	02	02	02	
Cultural:													
Prune & Train Trees	819												819
Pest Control - Dormant	27												27
Pest Control - Delayed Dormant		18											18
Weed Control - Strip Spray 3X		43		8			8						60
Pest Control - Gophers 3X			10										10
Weed Control - Mow Middle 7X			9	9	9	16	16						59
Pest Control - Scab			67										67
Frost Protection				32	32								64
Pest Control - Blight				85	68								154
Pest Control - Blight & Scab				67	69								135
Pest Control - Blight & Cover					58								58
Pest Control - Cover Spray						62	46						108
Irrigate						38	38						76
Fertilize - Nitrogen						22							22
Pest Control - Psylla & Mites				68		68	68						204
Apply Hormone								34					34
PCA Fees	4	4	4	4	4	4	4	4	4				35
Leaf Analysis							19						19
Pickup Truck Use	6	6	6	6	6	6	6	6	6	6	6	6	77
ATV Use	5	5	5	5	5	5	5	5	5	5	5	5	61
TOTAL CULTURAL COSTS	861	77	101	285	252	221	211	50	15	12	12	12	2,107
Harvest:													
Harvest Fruit - 1st Pick								317					317
Harvest Fruit - 2nd Pick								634					634
Haul To Packinghouse								157					157
TOTAL HARVEST COSTS								1,108					1,108
Packing:													
Sort/Pack/Sell Fruit								3,114					3,114
TOTAL PACKING COSTS								3,114					3,114
Assessment:													
California Pear Advisory								177					177
California Pear Growers								23					23
TOTAL ASSESSMENT COSTS								201					201
Postharvest:													
Irrigate								43	22				65
Fertilize - Nitrogen									22				22
Pest Control - Psylla & Mites									18				18
TOTAL POSTHARVEST COSTS								43	61				104
Interest on operating capital	5	6	6	8	10	11	12	40	0	0	0	0	98
TOTAL OPERATING COSTS/ACRE	867	82	108	293	262	232	223	4,555	76	11	11	11	6,731
TOTAL OPERATING COSTS/TON	43	4	5	15	13	12	11	228	4	1	1	1	337
OVERHEAD:													
Office Expense	4	4	4	4	4	4	4	4	4	4	4	4	44
Liability Insurance	7												7
Sanitation Fee	1	1	1	1	1	1	1	1	1				13
Property Taxes	73						73						146
Property Insurance	25						25						50
Investment Repairs	6	6	6	6	6	6	6	6	6	6	6	6	77
TOTAL CASH OVERHEAD COSTS	116	12	12	12	12	12	110	12	12	10	10	10	337
TOTAL CASH COSTS/ACRE	983	94	119	305	273	244	333	4,567	87	22	21	21	7,069
TOTAL CASH COSTS/TON	49	5	6	15	14	12	17	228	4	1	1	1	353

UC COOPERATIVE EXTENSION

**Table 5. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT,
and BUSINESS OVERHEAD COSTS**
NORTH COAST REGION – Lake/Mendocino Counties 2002

ANNUAL EQUIPMENT COSTS

Yr	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 #2	32,269	12	8,068	3,469	133	202	3,804
02	55 HP 2WD Tractor #1	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	Mower - Flail 9'	7,372	10	1,304	924	29	43	996
02	Orch.Sprayer 500 G #1	19,741	10	3,491	2,475	77	116	2,668
02	Orch.Sprayer 500 G #2	19,741	10	3,491	2,475	77	116	2,668
02	Pickup Truck 1/2 T	20,565	7	7,801	2,820	94	142	3,055
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		187,547		48,407	22,287	779	1,180	24,245
60% of New Cost*		112,528		29,044	13,372	467	708	14,547

*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	
INVESTMENT								
Buildings	44,693	20		4,027	147	223	894	5,292
Fuel Tanks & Pumps	3,500	25	350	279	13	19	70	380
Ladders - 16 Each	2,196	10	220	288	8	12	44	352
Land	487,500	99	487,500	31,249	0	4,875	0	36,124
Pear Establishment	250,600	95		16,107	827	1,253	0	18,187
Shop Tools	12,637	15	1,264	1,284	46	70	253	1,652
Sprinkler System	132,555	25		10,777	437	663	3,973	15,850
Worker Housing	8,217	20		740	27	41	164	973
TOTAL INVESTMENT	941,898		489,334	64,751	1,505	7,156	5,398	78,810

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	70	acre	7.20	504
Office Expense	70	acre	44.00	3,080
Sanitation Fee	70	acre	13.37	936

UC COOPERATIVE EXTENSION
Table 6. HOURLY EQUIPMENT COSTS
 NORTH COAST REGION - 2002

Yr	Description	COSTS PER HOUR								
		Actual Hours Used	Cash Overhead			Operating			Total Oper.	Total Costs/Hr.
			Capital Recovery	Insur- ance	Taxes	Repairs	Fuel & Lube			
02	3 Point Forks #1	72.00	0.57	0.02	0.03	0.10	0.00	0.10	0.71	
02	3 Point Forks #2	72.00	0.57	0.02	0.03	0.10	0.00	0.10	0.71	
02	55 HP 2WD Tractor #2	526.40	3.95	.015	.023	1.43	3.91	5.34	9.67	
02	55 HP 2WD Tractor #1	863.20	2.41	0.09	0.14	1.43	3.91	5.34	7.98	
02	ATV 4WD	285.00	2.15	0.07	0.11	0.55	1.16	1.71	4.03	
02	Bait Applicator	15.00	5.24	0.16	0.25	0.40	0.00	0.40	6.06	
02	Mower - Flail 9'	201.00	2.76	0.09	0.13	3.04	0.00	3.04	6.02	
02	Orch.Sprayer 500 G #1	171.70	8.65	0.27	0.41	3.34	0.00	3.34	12.66	
02	Orch.Sprayer 500 G #2	84.40	17.59	0.55	0.83	3.34	0.00	3.34	22.30	
02	Pickup Truck 1/2 T	285.00	5.94	0.20	0.30	1.51	4.34	5.85	12.28	
02	Truck - 10 Ton	203.00	14.41	0.53	0.80	3.99	9.06	13.05	28.79	
02	Weed Sprayer 100 G	39.20	7.57	0.23	0.36	1.05	0.00	1.05	9.21	

UC COOPERATIVE EXTENSION
Table 7. RANGING ANALYSIS
 NORTH COAST REGION – Lake/Mendocino Counties 2002

COSTS PER ACRE AT VARYING YIELD TO PRODUCE FRESH MARKET PEARS

	TOTAL YIELD (tons/acre)						
	16.00	18.00	20.00	22.00	24.00	26.00	28.00
OPERATING COSTS/ACRE:							
Cultural Cost	2,107	2,107	2,107	2,107	2,107	2,107	2,107
Harvest Cost	894	1,001	1,108	1,215	1,322	1,429	1,536
Postharvest Cost	104	104	104	104	104	104	104
Packing Cost	2,491	2,802	3,114	3,425	3,737	4,048	4,359
Assessment Cost	124	162	201	239	278	316	355
Interest on operating capital	92	95	98	101	104	106	109
TOTAL OPERATING COSTS/ACRE	5,812	6,271	6,732	7,191	7,652	8,110	8,570
TOTAL OPERATING COSTS/TON	363	348	337	327	319	312	306
CASH OVERHEAD COSTS/ACRE	336	337	337	337	337	337	338
TOTAL CASH COSTS/ACRE	6,148	6,608	7,069	7,528	7,989	8,447	8,908
TOTAL CASH COSTS/TON	384	367	353	342	333	325	318
NON-CASH OVERHEAD COSTS/ACRE	1,546	1,549	1,552	1,554	1,553	1,558	1,560
TOTAL COSTS/ACRE	7,694	8,157	8,621	9,082	9,542	10,005	10,468
TOTAL COSTS/TON	481	453	431	413	398	385	374

UC COOPERATIVE EXTENSION
Table 7 continued

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE (\$/ton)			YIELD (tons/acre)						
Fresh	Processing	Off-Grades	6.72	7.56	8.40	9.24	10.08	10.92	11.76
			6.40	7.20	8.00	8.80	9.60	10.40	11.20
			2.88	3.24	3.60	3.96	4.32	4.68	5.04
492.00	190.00	16.00	-1,244	-1,132	-1,022	-910	-800	-686	-575
542.00	210.00	18.00	-774	-603	-434	-264	-95	77	247
592.00	220.00	20.00	-368	-147	73	294	514	736	957
642.00	230.00	22.00	38	310	580	852	1,122	1,396	1,667
692.00	240.00	24.00	443	766	1,087	1,410	1,731	2,055	2,377
742.00	250.00	26.00	849	1,223	1,594	1,968	2,340	2,714	3,087
792.00	260.00	28.00	1,255	1,679	2,102	2,526	2,948	3,374	3,797

NET RETURNS PER ACRE ABOVE CASH COSTS

PRICE (\$/ton)			YIELD (tons/acre)						
Fresh	Processing	Off-Grades	6.72	7.56	8.40	9.24	10.08	10.92	11.76
			6.40	7.20	8.00	8.80	9.60	10.40	11.20
			2.88	3.24	3.60	3.96	4.32	4.68	5.04
492.00	190.00	16.00	-1,580	-1,469	-1,359	-1,247	-1,137	-1,023	-913
542.00	210.00	18.00	-1,110	-940	-771	-601	-432	-260	-91
592.00	220.00	20.00	-704	-484	-264	-43	177	399	619
642.00	230.00	22.00	-298	-27	243	515	785	1,059	1,329
692.00	240.00	24.00	107	429	750	1,073	1,394	1,718	2,039
742.00	250.00	26.00	513	886	1,257	1,631	2,003	2,377	2,749
792.00	260.00	28.00	919	1,342	1,765	2,189	2,611	3,037	3,459

NET RETURNS PER ACRE ABOVE TOTAL COSTS

PRICE (\$/ton)			YIELD (tons/acre)						
Fresh	Processing	Off-Grades	6.72	7.56	8.40	9.24	10.08	10.92	11.76
			6.40	7.20	8.00	8.80	9.60	10.40	11.20
			2.88	3.24	3.60	3.96	4.32	4.68	5.04
492.00	190.00	16.00	-3,126	-3,018	-2,911	-2,801	-2,690	-2,581	-2,473
542.00	210.00	18.00	-2,656	-2,489	-2,323	-2,155	-1,985	-1,818	-1,651
592.00	220.00	20.00	-2,250	-2,033	-1,816	-1,597	-1,376	-1,159	-941
642.00	230.00	22.00	-1,844	-1,576	-1,309	-1,039	-768	-499	-231
692.00	240.00	24.00	-1,439	-1,120	-802	-481	-159	160	479
742.00	250.00	26.00	-1,033	-663	-295	77	450	819	1,189
792.00	260.00	28.00	-627	-207	213	635	1,058	1,479	1,899