
UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2000

**SAMPLE COSTS to
ESTABLISH and PRODUCE
*PEARS***



NORTH COAST REGION

Green Bartlett – Sprinkler Irrigated

Prepared by:

Rachel B. Elkins	Pomology Farm Advisor, UC Cooperative Extension. Lake, Mendocino, Sutter and Yuba Counties
Karen M. Klonsky	Extension Specialist, Department of Agricultural and Resource Economics, UC Davis
Richard L. De Moura	Staff Research Associate, Department of Agricultural and Resource Economics, UC Davis

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

SAMPLE COSTS to ESTABLISH and PRODUCE PEARS

Green Bartlett - Sprinkler Irrigated

North Coast Region 2000

INTRODUCTION

The sample costs to establish a pear orchard and produce Bartlett pears under sprinkler irrigation in the North Coast Region are presented in this study. The study is intended as a guide only and can be used in making production decisions, determining potential returns, preparing budgets and evaluating production loans. Practices described are based on the pear establishment and production procedures considered typical for California's North Coast Region of Lake and Mendocino Counties. Sample costs given for labor, materials, equipment and contract services are based on current figures. Some costs and practices detailed in this study may not be applicable to every situation. A blank, *Your Cost*, column is provided to enter your actual costs in Tables 2 and 3.

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.

CONTENTS

INTRODUCTION	2
ASSUMPTIONS.....	3
Orchard Establishment Cultural Practices and Material Inputs.....	4
Production Cultural Practices and Material Inputs	6
Overhead Costs	10
ACKNOWLEDGEMENTS.....	12
REFERENCES.....	12
Table 1 Cost Per Acre to Establish a Pear Orchard	13
Table 2 Costs Per Acre to Produce Pears.....	15
Table 3 Costs and Returns Per Acre to Produce Pears	17
Table 4 Monthly Cash Costs Per Acre to Produce Pears.....	19
Table 5 Whole Farm Annual Equipment, Investment and Business Overhead.....	20
Table 6 Hourly Equipment Costs.....	21
Table 7 Ranging Analysis.....	21

Sample Cost of Production studies are available for many commodities and can be obtained through the Department of Agricultural Economics, UC Davis, and (530) 752-3589. Current studies, those prepared during the last five years, can be downloaded from their website, www.agecon.ucdavis.edu/outreach/outreach.htm or obtained from selected county Cooperative Extension offices.

The University of California, in accordance with applicable Federal and State law and University policy, does not discriminate on the basis of race, color, national origin, religion, sex, disability, age, medical condition (cancer-related), ancestry, marital status, citizenship, sexual orientation, or status as a Vietnam-era veteran or special disabled veteran. Inquiries regarding the University's nondiscrimination policies may be directed to the Affirmative Action Director, University of California, Agriculture and Natural Resources, 1111 Franklin, 6th Floor, Oakland, CA 94607-5200 (510) 987-0096.

ASSUMPTIONS

The following assumptions pertain to sample costs to establish a pear orchard and produce pears in the North Coast Region. Practices described are not recommendations by the University of California, but rather represent production practices considered typical for this crop and area. The practices and inputs used in this cost study serve only as a sample or guide. Some of these costs and practices may not be applicable to your situation or used during every production year. Additional ones not indicated may be needed. Establishment and cultural practices for the production of pears vary by grower and region. Variations can be significant. The costs are presented on an annual, per acre basis. **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 five acres are occupied by roads, irrigation systems, fencing, and farmstead. 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. It 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 price 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.

Year	Irrigation	Frost Protection	Total Applied 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, the orchard vegetation should be suppressed by spraying with herbicides or mowing during this period. Ground cover, especially grasses can also increase russetting during the early stages of fruit growth.

Orchard Establishment Cultural Practices and Material Inputs

Site Preparation. Land preparation begins with the removal of 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. Orchard removal, ripping, and fumigation are done by contract or custom operators. 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 Of N/Acre	Lbs Of Urea/Acre
1	35	76
2	45	98
3	75	163
4 - 6	100	217
7+	200	435

Pest Management. *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 the practice 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 begins in the fall/winter (November to February) of the first year with a mixture of a contact herbicide, Gramoxone , and a pre-emergent herbicide, Surflan , sprayed in the tree rows. This combination is used in the second year for the dormant strip spray, and is followed in the spring with separate in-season applications of Gramoxone- and Roundup- .

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. This 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. A tractor and orchard sprayer applies all of the pest control sprays.

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. It 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 budbreak but prior to clusterbud for pear scab and pear psylla control. Three additional scab sprays of Ziram , Flint , or Syllit may be 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 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.

Production Cultural Practices and Material Inputs

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. Written recommendations are required for many pesticides and written by licensed pest control advisors. For information and pesticide use permits, contact the local county Agricultural Commissioner's office.

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 (Surflan and Gramoxone). 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. Treatments for codling moth also help to control other lepidopteran pests such as leafrollers, 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 and Agrimek. Treatments made in this study include a dormant spray in January or early February, a delayed dormant spray in late February, combination psylla and mite sprays in June and July, and a postharvest spray 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, as described above, can cause the loss of complete branches or trees. Twelve treatments are made using a combination of Agri-mycin and Mycoshield from April through May. 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. Pesticides are the primary approach to combating the disease. 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. The material used in the first treatment is Ziram 76WG applied at budbreak during March. 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. 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 it 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 are harvested twice. The first pick 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. For growers who contract their harvest, the equipment and labor used for harvest operations should be removed from Harvest costs in Tables 2 to 4, and custom harvest charges should be added to Harvest costs in the same tables.

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.

Table C. Assumed Annual Yields of Bartlett Pears

Year	Total Yield	Fresh Market	Tons/Acre		Off-grade
			Processed		
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

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 of packout by various market categories for the previous ten years in Lake and Mendocino Counties is shown in Table D.

Table D. Tonnage and Percent Packout - Lake and Mendocino Counties Bartlett Pears 1990 - 1999¹

Year	Lake County				Mendocino County			
	Tons	Fresh	Processed	Off-grade	Tons	Fresh	Processed	Off-grade
		% of tons				% of tons		
1990	73,139	46	40	16	48,365	29	61	10
1991	81,194	42	40	18	53,670	26	63	11
1992	75,911	40	39	21	53,336	22	65	13
1993	51,316	44	39	17	50,466	26	67	08
1994	79,051	44	36	20	65,418	34	49	16
1995	66,530	40	40	20	46,588	28	54	18
1996	78,856	41	39	20	63,505	28	57	15
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
Avg	74,010	40	41	19	54,034	26	59	14

¹California Pear Advisory Board Annual Reports 1990 - 1999, Agricultural Commissioner Annual Report, Mendocino County 1990-1995

²Severe scab year

Returns. Estimated gross return prices per ton for the Bartlett Pear categories described above are: fresh market, \$492; processed, \$220; and off grade, \$20. In the previous ten years prices have ranged for fresh market from \$400 to \$700 per ton, processed from \$190 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). This 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.

Table E. California Pear Advisory Board Assessments for Bartlett Pears

Category	Price per Unit	Unit
<u>Fresh market</u>		
Tight-fill carton	\$0.30	36 lb. tight-fill carton
Standard box	\$0.375	44-46 lb. box
Metric box	\$0.337	40 lb box
LA lug	\$0.193	28 lb lug
<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.

Labor. Hourly wages for workers are \$7.91 and \$6.26 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 \$10.60 and \$8.39 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. The minimum wage in California will increase by \$1.00 per hour over a two-year period, beginning on January 1, 2001 when it increases from \$5.75 per hour to \$6.25 per hour. The second increase on January 1, 2002 will raise the minimum wage to \$6.75 per hour.

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.

Overhead Costs

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, 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 10.71% 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 0.723% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$455 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 portable toilets for the orchard and cost the farm \$161 per month. This cost includes delivery and servicing of toilets.

Non-Cash Overhead. Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments. Although farm equipment on pear orchards in the North Coast Region might be purchased new or used, this 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 (Equipment and Investments) are shown in Tables 1 to 3, and 5. They represent the capital recovery cost for investments on an annual per acre basis.

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). Put another way, 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 calculation for the annual capital recovery costs is as follows:

$$\frac{\text{Purchase Price} - \text{Salvage Value}}{\text{Capital Recovery Factor}} + \frac{\text{Salvage Value} \times \text{Interest Rate}}$$

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery (e.g., 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 wearout 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 equal to the purchase price because land does not depreciate. The purchase price and salvage value for certain 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. The interest rate of 7.08% 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.

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 \$10,276 per acre or \$256,900 for the 25-acre orchard. Establishment cost is amortized beginning in the sixth year over the remaining 95 years of production.

Equipment Cash Costs. 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 fuel, lubrication, and repairs. 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 cultural practice by the number of hours per acre for that operation. Tractor time is 10% higher than implement time (operation time) for a given operation to account for fueling, moving equipment, and setup time.

Repairs, Fuel and Lube. Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by the American Society of Agricultural Engineers (ASAE). Fuel and lubrication costs are also determined by ASAE equations based on maximum PTO hp, and type of fuel used. Prices for on-farm delivery of diesel and gasoline are \$1.26 and \$1.49 per gallon, respectively.

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

ACKNOWLEDGEMENTS

The authors acknowledge, and appreciate the comments and suggestions provided by Lars Crail, grower, Kelseyville; Pete Dodson, Lake Community Bank, Lakeport; Don and Margaret Eutenier, growers, Kelseyville; Diane Henderson, grower, Kelseyville; Mike Keithly, accountant, Lakeport; Broc Zoller, pest control advisor and grower, Kelseyville. Appreciation is also expressed to Brad Lawley, Tri Valley Growers, Stockton; Chris Zanobini and Bob McClain, California Pear Advisory Board; and Terry Barton, California Pear Growers for providing information, and insights into the pear industry.

REFERENCES

- American Society of Agricultural Engineers (ASAE). 1994. *American Society of Agricultural Engineers Standards Yearbook*. St. Joseph, MI.
- Agricultural Commissioner. *Annual Crop Report 1995, 1996, 1997*. Agricultural Commissioner. Lake County. Lakeport, CA
- Agricultural Commissioner. *Annual Crop Report 1990, 1991, 1992, 1993, 1994, 1995, 1996*. 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 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999*. California Pear Advisory Board. Sacramento, 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. 1991. *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.

UC Division of Agriculture and Natural Resources publications may be purchased through your local UC Cooperative Extension office, by calling 1-800-994-8849 or online at www.ucop.edu.

Table 1

UC COOPERATIVE EXTENSION
 SAMPLE COSTS PER ACRE TO ESTABLISH A PEAR ORCHARD
 NORTH COAST REGION - 2000

Year:	Cost Per Acre					
	1st	2nd	3rd	4th	5th	6th
Tons Per Acre:	0.0	0.0	0.0	0.0	4.0	7.0
Planting Costs:						
Remove Old Orchard	375					
Land Preparation - Rip 3X	250					
Land Preparation - Disc 2X	16					
Land Preparation - Fumigate	1,485					
Land Preparation - Apply Herbicide & Disc	20					
Layout Orchard	168					
Auger Tree Holes	125					
Plant Trees	76	3				
Trees: 182 Per Acre @ \$5.80 ea., (2% in 2nd year)	1,056	23				
Tree Guard & NPK Fertilizer	211	4				
Head Back Trees	25	1				
TOTAL PLANTING COSTS	3,807	31	0	0	0	0
Cultural Costs:						
Train Trees	25					
Pruning & Training		76	227	453	604	604
Fertilizer - Nitrogen	10	12	19	26	26	26
Weed Control - Disc 4X	29					
Weed Control - Mow Middles 7X		54	54	54	54	54
Weed Control - Strip Sprays	45	54	54	54	54	54
Pest Control - Dormant Spray		17	50	50	50	50
Pest Control - Delay Dormant Spray					19	20
Pest Control - Gophers	9	9	9	9	9	9
Pest Control - Budbreak Spray					23	23
Pest Control - Pear Scab Sprays					28	28
Pest Control - Fire Blight			93	195	194	195
Pest Control - Fire Blight & Pear Scab Sprays					116	120
Pest Control - Cover Sprays					104	104
Pest Control - Psylla & Mite Sprays					203	203
Fruit Sizing - Hormone Spray					33	33
Irrigate	116	116	133	133	113	113
Frost Protection 18X					55	62
PCA Fees			35	35	35	35
Leaf Analysis				16	16	19
Pickup Truck Use	70	70	70	70	70	70
ATV Use	55	55	55	55	55	55
TOTAL CULTURAL COSTS	359	463	799	1,150	1,861	1,877
Harvest Costs:						
Pick Fruit					218	355
Haul to Shed					29	51
Sort/Pack/Store/Sell Fruit					629	1,090
TOTAL HARVEST COSTS	0	0	0	0	876	1,496
Postharvest:						
Irrigate					20	20
Pest Control - Postharvest Oil					17	17
TOTAL POSTHARVEST COSTS	0	0	0	0	37	37
Assessments:						
California Pear Advisory Board					33	32
California Pear Growers					4	5
TOTAL ASSESSMENT COSTS	0	0	0	0	37	37
Interest On Operating Capital @ 10.71%	405	17	29	35	65	77
TOTAL OPERATING COSTS/ACRE	4,571	511	828	1,185	2,876	3,524

UC COOPERATIVE EXTENSION
Table 1. continued

Year:	Cost Per Acre					
	1st	2nd	3rd	4th	5th	6th
Tons Per Acre:					4	7
Cash Overhead Costs:						
Office Expense	44	44	44	44	44	44
Sanitation Fees	4	4	4	4	4	4
Liability Insurance	6	6	6	6	6	6
Property Taxes	91	90	91	91	93	148
Property Insurance	66	65	66	66	68	107
Investment Repairs	89	89	89	89	90	90
TOTAL CASH OVERHEAD COSTS	300	298	300	300	305	399
TOTAL CASH COSTS/ACRE	4,866	809	1,128	1,485	3,181	3,923
INCOME/ACRE FROM PRODUCTION	0	0	0	0	1,193	2,088
NET CASH COSTS/ACRE FOR THE YEAR	4,866	809	1,128	1,485	1,988	1,835
ACCUMULATED NET CASH COSTS/ACRE	4,866	5,675	6,803	8,288	10,276	12,111
Capital Recovery Cost: (Non-Cash Overhead)						
Shop Building	61	61	61	61	61	61
Worker Housing	11	11	11	11	11	11
Fuel Tank & Pump	9	9	9	9	9	9
Shop Tools	19	19	19	19	19	19
Sprinkler Irrigation System	164	164	164	164	164	164
Hand Tools	7	7	7	7	7	7
Deer Fence - Electric	36	36	36	36	36	36
Ladders - 16 Each					4	4
Land @ \$6,964/Acre	493	493	493	493	493	493
Equipment	80	53	79	98	121	220
TOTAL CAPITAL RECOVERY COSTS	880	853	879	898	925	1,024
TOTAL COST/ACRE FOR THE YEAR	5,746	1,662	2,007	2,383	4,106	4,947
INCOME/ACRE FROM PRODUCTION	0	0	0	0	1,193	2,088
TOTAL NET COST/ACRE FOR THE YEAR	5,746	1,662	2,007	2,383	2,913	2,859
TOTAL ACCUMULATED NET COST/ACRE	5,746	7,408	9,415	11,798	14,711	17,570

Table 2

UC COOPERATIVE EXTENSION
COSTS PER ACRE to PRODUCE PEARS
NORTH COAST REGION - 2000

Operation	Operation Time (Hrs/A)	Cash and Labor Cost per acre					Total Cost	Your Cost
		Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent			
Cultural:								
Pest Control - Dormant	0.25	3	2	22	0	28		
Pest Control - Delayed Dormant	0.25	3	2	11	0	17		
Weed Control - Strip Spray 3X	0.53	7	4	44	0	54		
Pest Control - Gophers 3X	0.20	3	1	6	0	9		
Pest Control - Budbreak	0.23	3	2	25	0	30		
Weed Control - Mow Middles 7X	2.52	32	22	0	0	54		
Pest Control - Pear Scab	0.50	6	5	54	0	65		
Irrigate-Frost Protection	1.54	13	0	49	0	62		
Irrigate	3.00	25	0	47	0	72		
Pest Control - Fungicide Spray	0.25	3	2	38	0	43		
Pest Control - Fire Blight	2.50	32	23	111	0	166		
Pest Control - Fire Blight & Pear Scab	0.50	6	5	88	0	99		
Prune & Train Trees	0.00	0	0	0	819	819		
Pest Control - Fire Blight & Cover	0.25	3	2	51	0	46		
Pest Control - Cover Spray	0.75	10	7	104	0	120		
Fertilize - Nitrogen	0.00	0	0	24	0	24		
Pest Control - Psylla & Mites	0.50	6	5	192	0	203		
Apply Hormone	0.23	3	2	28	0	33		
PCA Fees	0.00	0	0	0	35	35		
Leaf Analysis	0.00	0	0	0	19	19		
Pickup Truck Use	3.80	48	22	0	0	70		
ATV Use	3.80	48	11	0	0	59		
TOTAL CULTURAL COSTS	21.59	255	117	895	873	2,139		
Harvest:								
Harvest Fruit - 1st Pick	0.32	8	4	0	304	316		
Harvest Fruit - 2nd Pick	0.64	16	8	0	607	631		
Haul To Packinghouse	5.72	73	75	0	0	147		
TOTAL HARVEST COSTS	6.68	97	86	0	911	1,094		
Packing:								
Sort/Pack/Store/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	25	0	35	0	61		
Fertilize - Nitrogen	0.00	0	0	24	0	24		
Pest Control - Psylla	0.25	3	2	11	0	17		
TOTAL POSTHARVEST COSTS	3	28	2	71	0	102		
Interest on operating capital @ 10.71%						141		
TOTAL OPERATING COSTS/ACRE		381	205	1,167	4,898	6,791		
TOTAL OPERATING COSTS/TON						340		

UC COOPERATIVE EXTENSION
Table 2 continued

CASH OVERHEAD:			
Office Expense			44
Liability Insurance			6
Sanitation Fee			4
Property Taxes			151
Property Insurance			109
Investment Repairs			90
TOTAL CASH OVERHEAD COSTS			405
TOTAL CASH COSTS/ACRE			7,196
TOTAL CASH COSTS/TON			358
NON-CASH OVERHEAD:			
	Per producing	Annual Cost	
Investment	Acre	Capital Recovery	
Buildings	638	61	61
Worker Housing	117	11	11
Fuel Tanks & Pumps	101	9	9
Shop Tools	181	19	19
Sprinkler System	1,894	164	164
Hand Tools	66	7	7
Deer Fence - Electric	506	36	36
Ladders - 16 Each	31	4	4
Land	6,964	493	493
Pear Establishment	10,276	729	729
Equipment	1,988	246	246
TOTAL NON-CASH OVERHEAD COSTS			1,779
TOTAL COSTS/ACRE			8,974
TOTAL COSTS/TON			449

Table 3

UC COOPERATIVE EXTENSION
COSTS AND RETURNS PER ACRE to PRODUCE PEARS
NORTH COAST REGION - 2000

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Fresh	8.40	ton	492.00	4,133	
Processed/Unrestricted	8.00	ton	220.00	1,760	
Off-Grades/Restricted	3.60	ton	20.00	72	
TOTAL GROSS RETURNS	20.00	ton		5,965	
OPERATING COSTS					
Insecticide:					
Volck Supreme Oil	24.00	gal	2.80	67	
Asana XL	16.00	oz	1.08	17	
Guthion 50W	9.00	lb	9.75	88	
Imidan 70WSB	6.00	lb	7.55	45	
Agri-Mek	25.00	oz	6.78	169	
Herbicide:					
Gramoxone Extra	2.00	pint	5.33	11	
Surflan AS	2.40	pint	11.25	27	
Roundup Ultra	1.00	pint	6.18	6	
Rodenticide:					
Rodent Bait	1.00	lb	5.62	6	
Fungicide:					
Lime Sulfur Solution	2.00	gal	2.34	5	
Wilbur Ellis Sulfur DF	4.00	lb	0.85	3	
Ziram WDG 76	9.00	lb	2.52	23	
Benlate SP	30.00	oz	1.26	38	
Flint	5.00	oz	12.50	63	
Syllit 65W	3.00	lb	11.50	35	
Antibiotic:					
Mycoshield	3.50	lb	21.40	75	
Agri-mycin 17	56.00	oz	1.44	81	
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	
Water:					
Water - Frost Protection	18.00	acin	2.75	50	
Water - Pumped	30.03	acin	2.75	83	
Fertilizer:					
46-0-0 (Urea)	200.00	lb N	0.24	49	
Growth Regulator					
K-Salt 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 - Processing	11.60	ton	32.00	371	
Assessment:					
CA Pear 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	1.50	5	
CA Pear Growers	11.60	ton	2.00	23	
Labor (machine)	29.93	hrs	10.60	317	
Labor (non-machine)	7.54	hrs	8.39	63	
Fuel - Gas	13.67	gal	1.49	20	
Fuel - Diesel	70.28	gal	1.26	89	
Lube				16	
Machinery repair				80	
Interest on operating capital @ 10.71%				141	
TOTAL OPERATING COSTS/ACRE				6,791	
TOTAL OPERATING COSTS/TON				340	
NET RETURNS ABOVE OPERATING COSTS				-826	

UC COOPERATIVE EXTENSION
Table 3 continued

CASH OVERHEAD COSTS:	
Office Expense	44
Liability Insurance	6
Sanitation Fee	4
Property Taxes	151
Property Insurance	109
Investment Repairs	90
TOTAL CASH OVERHEAD COSTS/ACRE	405
TOTAL CASH COSTS/ACRE	7,196
TOTAL CASH COSTS/TON	360
NON-CASH OVERHEAD COSTS (capital recovery)	
Buildings	61
Worker Housing	11
Fuel Tanks & Pumps	9
Shop Tools	19
Sprinkler System	164
Hand Tools	7
Deer Fence - Electric	36
Ladders - 16 Each	4
Land	493
Pear Establishment	729
Equipment	246
TOTAL NON-CASH OVERHEAD COSTS/ACRE	1,779
TOTAL COSTS/ACRE	8,974
TOTAL COSTS/TON	449
NET RETURNS ABOVE TOTAL COSTS	-3,010

Table 4

U.C. COOPERATIVE EXTENSION
MONTHLY CASH COSTS PER ACRE to PRODUCE PEARS
NORTH COAST REGION - 2000

Beginning JAN 00	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Ending DEC 00	00	00	00	00	00	00	00	00	00	00	00	00	
Cultural:													
Prune & Train Trees	819												819
Pest Control - Dormant	28												28
Pest Control - Delayed Dormant		17											17
Weed Control - Strip Spray		36		10			9						54
Pest Control - Gophers 3X			9										9
Pest Control - Budbreak			30										30
Weed Control - Mow Middle			8	8	8	15	15						54
Pest Control - Scab			28	37									65
Frost Protection-Irrigate				31	31								62
Irrigate						36	36						72
Pest Control - Fungicide				43									43
Pest Control - Blight				99	66								166
Pest Control - Blight & Scab				48	51								99
Pest Control - Blight & Cover					57								57
Pest Control - Cover Spray						69	51						120
Fertilize - Nitrogen						24							24
Pest Control - Psylla & Mites						17	186						203
Apply Hormone								33					33
PCA Fees		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	70
ATV Use	5	5	5	5	5	5	5	5	5	5	5	5	59
TOTAL CULTURAL COSTS	862	67	91	292	228	177	330	48	15	11	11	11	2,139
Harvest:													
Harvest Fruit - 1st Pick								316					316
Harvest Fruit - 2nd Pick								631					631
Haul To Packinghouse								147					147
TOTAL HARVEST COSTS								1,094					1,094
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								40	20				61
Fertilize - Nitrogen									24				24
Pest Control - Psylla									17				17
TOTAL POSTHARVEST COSTS								40	61				102
Interest on operating capital	8	8	9	12	14	15	18	58	-1	0	0	0	141
TOTAL OPERATING COSTS/ACRE	869	75	100	303	242	192	348	4,555	76	11	11	10	6,791
TOTAL OPERATING COSTS/TON	43	4	5	15	12	10	17	228	4	1	1	1	340
OVERHEAD:													
Office Expense	4	4	4	4	4	4	4	4	4	4	4	4	44
Liability Insurance	6												6
Sanitation Fee		1	1	1	1	1	1	1	1				4
Property Taxes	76						76						151
Property Insurance	55						55						109
Investment Repairs	7	7	7	7	7	7	7	7	7	7	7	7	90
TOTAL CASH OVERHEAD COSTS	148	12	12	12	12	12	142	12	12	11	11	11	405
TOTAL CASH COSTS/ACRE	1017	87	112	314	254	203	490	4567	87	22	22	22	7196
TOTAL CASH COSTS/TON	51	4	6	16	13	10	25	228	4	1	1	1	360

Table 5

UC COOPERATIVE EXTENSION
WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT,
and BUSINESS OVERHEAD COSTS
NORTH COAST REGION - 2000

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
						Insur- ance	Taxes	
00	3 Point Forks #1	670	15	64	71	3	4	78
00	3 Point Forks #2	670	15	64	71	3	4	78
00	55 HP 2WD Tractor #2	32,269	12	8,068	3,631	146	202	3,979
00	55 HP 2WD Tractor #1	32,269	12	8,068	3,631	146	202	3,979
00	ATV 4WD	7,430	7	1,314	967	32	44	1,042
00	Bait Applicator	1,046	10	185	136	4	6	147
00	Mower - Flail 9'	7,372	10	1,304	959	31	43	1,034
00	Orch.Sprayer 500 G #1	19,741	10	3,491	2,569	84	116	2,769
00	Orch.Sprayer 500 G #2	19,741	10	3,491	2,569	84	116	2,769
00	Pickup Truck 1/2 T	20,565	7	7,801	2,927	103	142	3,172
00	Truck - 10 Ton	41,827	10	12,355	5,086	196	271	5,553
00	Weed Sprayer 100 G	3,947	10	698	514	17	23	554
TOTAL		187,547		46,903	23,134	848	1,172	25,154
60% of New Cost*		112,528		28,142	13,880	509	703	15,092

*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	0	4,245	162	223	894	5,524
Deer Fence - Electric	12,649	99	0	897	46	63	252	1,258
Fuel Tanks & Pumps	7,088	20	709	656	28	39	142	865
Hand Tools	4,595	15	460	489	18	25	92	624
Ladders - 16 Each	2,196	10	220	298	9	12	44	363
Land	487,500	99	487,500	34,515	3,525	4,875	0	42,915
Pear Establishment	256,900	95	0	18,216	929	1,284	0	20,429
Shop Tools	12,637	15	1,264	1,344	50	70	253	1,717
Sprinkler System	132,555	25	0	11,457	479	663	3,973	16,572
Worker Housing	8,217	20	0	780	30	41	164	1,015
TOTAL INVESTMENT	969,030		490,153	72,897	5,275	7,296	5,814	91,282

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/		Price/ Unit	Total Cost
	Farm	Unit		
Liability Insurance	75	Acre	6.07	455
Office Expense	70	Acre	44.00	3,080
Sanitation Fee	70	Acre	4.41	309

Table 6

UC COOPERATIVE EXTENSION
HOURLY EQUIPMENT COSTS
NORTH COAST REGION - 2000

Yr	Description	COSTS PER HOUR							Total Costs/Hr.
		Actual Hours Used	Cash Overhead			Operating			
			Capital Recovery	Insur- ance	Taxes	Repairs	Fuel & Lube	Total Oper.	
00	3 Point Forks #1	72.00	0.60	0.02	0.03	0.10	0.00	0.10	0.74
00	3 Point Forks #2	72.00	0.60	0.02	0.03	0.10	0.00	0.10	0.74
00	55 HP 2WD Tractor #2	78.40	27.79	1.12	1.54	1.41	3.91	5.32	35.77
00	55 HP 2WD Tractor #1	893.30	2.44	0.10	0.14	1.41	3.91	5.32	7.99
00	ATV 4WD	294.50	1.97	0.06	0.09	0.89	1.71	2.60	4.73
00	Bait Applicator	15.00	5.45	0.18	0.25	0.40	0.00	0.40	6.27
00	Mower – Flail 9'	201.00	2.86	0.09	0.13	3.02	0.00	3.02	6.11
00	Orchard Sprayer 500G #1	208.50	7.40	0.24	0.33	3.31	0.00	3.31	11.28
00	Orchard Sprayer 500G #2	75.00	20.55	0.67	0.93	3.31	0.00	3.31	25.47
00	Pickup Truck 1/2 T	285.00	6.16	0.22	0.30	1.50	4.28	5.78	12.46
00	Truck - 10 Ton	203.00	15.03	0.58	0.80	3.97	9.06	13.03	29.44
00	Weed Sprayer 100 G	39.20	7.86	0.26	0.36	1.05	0.00	1.05	9.53

Table 7

UC COOPERATIVE EXTENSION
RANGING ANALYSIS
NORTH COAST REGION - 2000

COSTS PER ACRE AT VARYING YIELD TO PRODUCE FRESH MARKET PEARS

	YIELD in Tons/Acre						
	16.00	18.00	20.00	22.00	24.00	26.00	28.00
OPERATING COSTS/ACRE:							
Cultural Cost	2,139	2,139	2,139	2,139	2,139	2,139	2,139
Harvest Cost	936	1,015	1,094	1,174	1,253	1,332	1,411
Postharvest Cost	102	102	102	102	102	102	102
Packing Cost	2,491	2,802	3,114	3,425	3,737	4,048	4,359
Assessment Cost	161	181	201	221	241	261	281
Interest on operating capital	139	140	141	142	142	143	144
TOTAL OPERATING COSTS/ACRE	5,968	6,379	6,791	7,203	7,614	8,025	8,436
TOTAL OPERATING COSTS/TON	373	354	340	327	317	309	301
CASH OVERHEAD COSTS/ACRE	405	405	405	405	404	404	404
TOTAL CASH COSTS/ACRE	6,373	6,784	7,196	7,608	8,018	8,429	8,840
TOTAL CASH COSTS/TON	398	377	360	346	334	324	316
NON-CASH OVERHEAD COSTS/ACRE	1,781	1,780	1,779	1,777	1,775	1,773	1,770
TOTAL COSTS/ACRE	8,154	8,564	8,975	9,385	9,793	10,202	10,610
TOTAL COSTS/TON	510	476	449	427	408	392	379

Bold = Yields in study

UC COOPERATIVE EXTENSION
Table 7 continued

NET RETURNS PER ACRE ABOVE OPERATING COSTS for PEARS

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
392.00	200.00	16.00	-2,008	-1,924	-1,841	-1,758	-1,674	-1,589	-1,505
442.00	210.00	18.00	-1,602	-1,467	-1,333	-1,200	-1,065	-930	-795
492.00	220.00	20.00	-1,196	-1,011	-826	-642	-456	-271	-85
542.00	230.00	22.00	-790	-554	-319	-84	152	389	625
592.00	240.00	24.00	-385	-98	188	474	761	1,048	1,335
642.00	250.00	26.00	21	359	695	1,032	1,370	1,707	2,045
692.00	260.00	28.00	427	815	1,203	1,590	1,978	2,367	2,755

NET RETURNS PER ACRE ABOVE CASH COSTS for PEARS

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
392.00	200.00	16.00	-2,413	-2,329	-2,246	-2,163	-2,078	-1,993	-1,909
442.00	210.00	18.00	-2,007	-1,872	-1,738	-1,605	-1,469	-1,334	-1,199
492.00	220.00	20.00	-1,601	-1,416	-1,231	-1,047	-860	-675	-489
542.00	230.00	22.00	-1,195	-959	-724	-489	-252	-15	221
592.00	240.00	24.00	-790	-503	-217	69	357	644	931
642.00	250.00	26.00	-384	-46	290	627	966	1,303	1,641
692.00	260.00	28.00	22	410	798	1,185	1,574	1,963	2,351

NET RETURNS PER ACRE ABOVE TOTAL COSTS for PEARS

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
392.00	200.00	16.00	-4,194	-4,109	-4,025	-3,940	-3,853	-3,766	-3,679
442.00	210.00	18.00	-3,788	-3,652	-3,517	-3,382	-3,244	-3,107	-2,969
492.00	220.00	20.00	-3,382	-3,196	-3,010	-2,824	-2,635	-2,448	-2,259
542.00	230.00	22.00	-2,976	-2,739	-2,503	-2,266	-2,027	-1,788	-1,549
592.00	240.00	24.00	-2,571	-2,283	-1,996	-1,708	-1,418	-1,129	-839
642.00	250.00	26.00	-2,165	-1,826	-1,489	-1,150	-809	-470	-129
692.00	260.00	28.00	-1,759	-1,370	-981	-592	-201	190	581