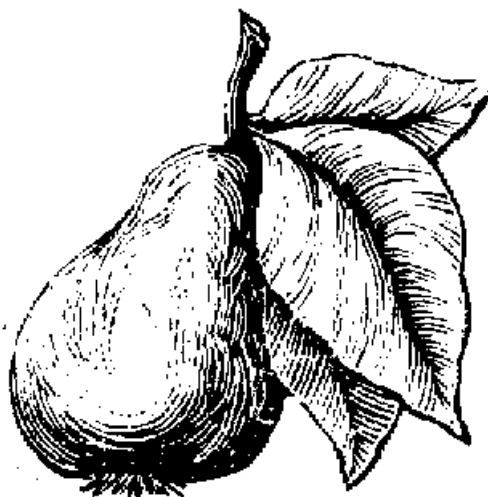

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

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**SAMPLE PRODUCTION COSTS
USING MATING DISRUPTION IN**

PEARS

GREEN BARTLETT



NORTH COAST – LAKE COUNTY

**Production costs over seven years using aerosol mating
disruption (puffers) for codling moth control**

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SAMPLE COSTS to PRODUCE PEARS
Green Bartlett – with Mating Disruption
North Coast Region – Lake County 2003

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INTRODUCTION

Sample costs to convert a Green Bartlett pear orchard to aerosol-released mating disruption (puffers) for codling moth control and for producing pears under the system in the North Coast Region – Lake County are presented in this study. The materials and methods used to monitor insect pests reflect many of the practices implemented by UC Cooperative Extension, Lake County, during the tenure of the Lake County Areawide Codling Moth Puffer Project in Kelseyville. The UC-led project ran from 1996 through 2001, but the data in this study is based on data from orchards participating from 1996 through 2002. The project encompassed 160 acres from 1996-1998, 500 acres in 1999, 820 acres in 2000, and 1,300 acres in 2001. After the project officially ended, 1,133 acres continued with the program in 2002. Actual practices will vary due to individual and pest control adviser (PCA) preferences and prevailing economics. Standard practices described are based on production practices considered typical for California’s North Coast Region of Lake County. Costs and practices for converting to puffers for codling moth control are based on data and pesticide reports collected from farms converting to and/or currently using puffers. Sample costs for labor, materials, equipment and custom services are based on current retail figures. Many items such as equipment and pesticides are discounted to the grower, but are not taken into account in this study. 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.

Sample Cost of Production studies are available for many commodities and can be obtained through the Department of Agricultural and Resource Economics - UC Davis, (530) 752-3589. Current studies can be downloaded from the website, <http://coststudies.ucdavis.edu> or obtained from selected county Cooperative Extension offices.

ASSUMPTIONS

The following assumptions refer to Tables 1 to 11 and pertain to transition and production costs using an aerosol pheromone (puffer) mating disruption system (MD) for codling moth control in the North Coast Region – Lake County. Practices described represent typical and/or new production practices for this crop and area. The practices and inputs used in this cost study serve as a guide only. All costs and practices may not be applicable to your situation or used during every production year. Cultural practices for pear production varies by grower and region and variations can be significant. For pear orchard establishment and production costs using standard practices, see *Sample Costs to Establish and Produce Pears, 2003, North Coast*. **The use of trade names and cultural practices 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 or cultural practices.**

Farm. The hypothetical farm consists of 70 acres of pear production, and five acres occupied by roads, irrigation systems, fencing, and farmstead. The farm is on alluvial bottomland, typical of the North Coast - Lake County.

Transition Operating Costs

Table 1 Series. Grower costs converting from a standard pesticide spray program for codling moth control to a pheromone mating disruption system using puffers are shown in the tables. Pesticide data for Transition Years 1, 2, 3, 4, 5, 6, and 7 are taken from county/state monthly pesticide reports submitted by growers participating in the Lake County puffer project from 1996 to 2002. In 2000, there were 16 project orchards in the first and second years, and five in the fifth. In 2001, there were 18 orchards in the first year, 15 in the second, 14 in the third, two in the fourth and five in the sixth. In 2002, there were 18 orchards in the second year, 14 in the third, 14 in the fourth, two in the fifth, and five in the seventh. Only predominant grower practices are shown in the tables. Being practices varied slightly among growers, pest applications to less than 20% of the program acres and applied by less than 20% of the growers were not considered a normal or typical practice and not included.

Pest Management. Codling moth (CM) and obliquebanded leafroller (OBLR) are the primary and secondary pests, respectively, of codling moth mating disruption programs. The mating disruption system reduced the number of CM sprays from four (conventional method) to two in both the first and second transition years. Sprays decreased again in the third year and are eliminated by the sixth year. OBLR is controlled with Lorsban and oil in March. By the second year, the fall psylla and mite sprays are eliminated. The grower applies the sprays with his equipment, and manages the puffers. In this study, the PCA manages the trap operations – hangs traps, checks traps, changes lures, counts eggs, checks tree damage, compiles weekly results, and takes down traps. Table 5 shows man-hours to complete monitoring operations in a typical year as experienced by UCCE staff. This table is provided only as a reference and may not reflect the actual monitoring operations or costs incurred by growers and PCAs. PCAs may employ combinations of one or more tactics presented in the table in order to provide cost-effective service to clientele.

It has been observed that besides rust mites and OBLR, pests such as box elder bug, stink bug, western flower thrips, katydids, pear slug, cucumber beetle and other lepidoptera pests have increased under MD. These pests may require “non-typical” treatments on a fraction of the acreage in a given year. This appears to be a trend in orchards under mating disruption that no longer utilize a standard insecticide program. It likely that more “non-typical” treatments will be needed in orchards under MD, although the numbers of formerly standard treatments are being diminished.

Harvest/Yields. Growers use standard harvesting practices. Fruit was evaluated for damage during the tenure of the project but showed no significant changes from the standard pest control program in yields and fruit quality as long as appropriate control measures were employed when needed.

Operating Costs. Cultural costs declined from the conventional/standard practices in the first year and remained below the conventional/standard practice in each of the following years. The “Total Operating Costs” for each of the seven years, using current costs (2003), declined compared to conventional/standard practices. During the first two years in the program, total operating costs were reduced by \$44 and \$36, respectively, an average of \$40 per acre per year. From the third to seventh years, savings ranged from \$100 to \$207 per acre per year, an average of \$160 per acre per year. Fluctuations in savings were mainly due to the variability in psylla and mite applications as well as the addition of a post harvest spray for rust mites that began in the sixth year due to the reduced sprays in the previous years. During the third, fourth and fifth year, one oil spray was combined with the codling moth spray. In the sixth and seventh years, instead of the combination spray, an additional spray with Agri-mek and oil was applied.

Production Operating Costs Using Puffers (Based on Year 7 Data)

Trees. The pear cultivar is Green Bartlett on Winter Nellis rootstock, a common combination in Lake County. Bartlett is a dual-purpose pear, utilized for both fresh market and processing. The trees are planted on 12' X 20' spacing, 182 trees per acre. Pear trees have a long production life if they are well maintained. 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, well characteristics, and other irrigation factors. In this study, water is calculated to cost \$45.36 per acre-foot (\$3.76/acin). No assumption is made about effective rainfall.

Frost Protection. Trees may be protected from low temperatures by wind machines, orchard heaters, and/or sprinkler applied water. 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. Water is sprinkled onto the orchard floor using the existing irrigation system.

Pruning. In this study, a contract hand crew prunes during 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 during the season and by leaf analysis in July. 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. Over fertilization can cause excessive shoot growth, resulting in increased susceptibility to fire blight, and reduced fruit set due to shading.

Pest Management. Pesticides, rates, and cultural practices mentioned in this cost study are listed in the *UC IPM Pest Management Guidelines, Pear*, and *Integrated Pest Management for Apples and Pears*. For more information on other pesticides available, pest identification, monitoring, and management visit the UC IPM website at www.ipm.ucdavis.edu. For information and pesticide use permits, contact the local county Agricultural Commissioner's office. Pesticide costs in this study are suggested retail, but may be discounted to the grower depending upon market and quantity.

Pest Control Adviser (PCA). Written recommendations are required for many pesticides and written by licensed PCAs. In addition, the PCA monitors the field for pests and nutrition. Growers may hire private PCAs or receive the service as part of a service agreement with an agricultural chemical and fertilizer company. In this study, the grower hires a private PCA. PCA fees are based on a level of service to the grower and may vary. The puffer program requires additional time for hanging and monitoring a greater number of traps versus the standard program, as well as additional monitoring for eggs and damage. In this study, we assume the PCA charges a higher fee than under standard practices.

Weeds. Preemergent/residual and contact herbicides (Goal and Roundup) are applied to the tree row during the dormant period - November to February. In this study the dormant strip spray is applied in February. During the growing season, strip sprays using either Roundup or Gramoxone are applied to the tree rows. The row middles are mowed seven times from March through July.

Insects and Arthropods. Pests in this study are codling moth (CM), obliquebanded leafroller (OBLR), pear psylla, and mites. CM is the primary pest because it makes fruit unmarketable. Control is based on monitoring of the population and counting degree-days. The first generation usually begins hatching in late April or early May; the second and third generations normally occur in July and August.

Traps are placed in the trees to monitor CM and OBLR populations. Trap type and density in this study are those used by UCCE and assumed to be adopted by the PCA. In late March, the PCA hangs 3 codling moth traps at 3 traps per 5 acres (0.6 traps/acre) in the tree. The three traps, one with a CM 1X lure and one with a CM 10X lure are hung high in the tree, and one with a CM 1X lure is hung low. In this study, the single trap cost is the cost of 2 traps, because each trap is made from parts of 2 traps. The PCA replaces the lures and liners monthly from April through August and checks the traps weekly for moth counts. Also in late March, the grower hangs in the tree an average of 13 puffers per 10 acres or 1.3 puffers per acre. Each puffer unit contains a canister that emits a mating disruption pheromone programmed to emit 7.5 mg of codlemone every 15 minutes from 3:00 pm to 3:00 am per acre over the season. The emissions stop at temperatures below 50° F. The grower inspects the puffers on a regular schedule from March through August and checks the puffer programming and batteries in July. In this study, the grower purchases the traps and lures and the (PCA) hangs the traps, checks the traps, and changes the lures. The trap operations in the study are the material costs. If the PCA provides the traps and lures, the PCA monitoring fee will increase to compensate for these material costs.

The puffer rate of 1.3 puffers per acre is based on orchard blocks over 40 acres. **In blocks of 40 acres or less with no adjoining orchards using puffers, the rate remains at 1.5 to 2 units per acre (the first year rate) due to higher border to interior ratio.** Blocks with high initial codling moth population will also require the higher rate of puffers as well. Application rates should be decided by the grower and PCA based on initial population, orchard size and layout, and practices of neighboring orchards. The orchards in the Lake County project averaged 1.6 units per acre from 1996 to 1998. The rate decreased to 1.3 per acre in 1999 and 1.13 per acre in 2000 to 2001. The rate increased to 1.3 per acre in 2002 due to higher CM pressure. This stemmed from orchard removal and reduced pest control caused by poor economic conditions from 1999-2001. OBLR is currently the main secondary pest in mating disruption programs. It over-winters as immature larvae

under the bark scales and emerges in mid-May to mid-June depending upon the temperature. The larvae feed on flower parts and young fruit. In CM mating disruption orchards, Lorsban and oil are applied in March to control OBLR. To monitor the population, the PCA hangs one OBLR trap per five acres (0.2 traps/acre) high in the tree in late April, one month after the CM traps are hung, and checks the trap and changes the lures through September.

Pear psylla injects a toxin into the tree, produces honeydew, and vectors the disease pear decline. Psylla is primarily controlled with horticultural oil (Dormant Plus, 415 or 440 oil) and avermectin (Agrimek). Treatments made in this study include an oil spray in January or early February, and Agrimek plus oil in April and June. The grower applies the insecticides with his spray equipment

Mites can cause damage in pears even at low levels (two per leaf). Dormant oil (Dormant Plus) sprays during the winter control some mites and narrow range oil sprays (415 and 440) mixed with the psylla sprays control mites during the season. **Being the same materials are used for psylla and mite control, spray applications in this study are shown as psylla/mite applications.**

Other pests that may require treatment under MD (as stated previously) include true bugs, pear slug, western flower thrips, and miscellaneous beetle and lepidopterous insects, which are normally controlled by insecticides.

Diseases. In the spring, fire blight symptoms can appear in blossom clusters and shoot tips. Severe infections may kill entire branches or trees. Fire blight is controlled with copper compounds (Kocide) or antibiotics (Mycoshield and Agrimycin), avoiding excessive tree vigor, and elimination of infected branches. Antibiotics are used in this study and applied to one side of the tree (alternate rows) when applied alone and every row when applied in combination with other sprays. Twelve blight sprays are applied: five blight only in April and five in May, and two combination scab/blight sprays - one each in April and May.

Pear scab is a serious fungus disease in the North Coast region. It attacks young fruit, and often causes the young pears to drop. Ziram is applied in March. Combination scab/blight sprays are made with Flint for scab control in April and with Syllit in May.

Vertebrate Pests. The major vertebrate pest is pocket gopher (*Thomomys sp.*). In this study, poison bait is applied in the spring when populations are low. The bait is placed underground in an artificial burrow made by a mechanical bait applicator and tractor.

Growth Regulator. Liqui-Stik is applied in August, 5 to 7 days before harvest to control pear drop for up to 4 weeks.

Harvest. The orchard is harvested twice in August. 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

Table A. Tonnage and Percent Packout
Lake County Bartlett Pears 1998 - 2002¹

Lake County				
Year	Tons	Fresh	Processed	Off-grade
		% of tons		
1998 ²	72,787	25	51	24
1999	82,453	42	40	18
2000	62,749	46	42	12
2001	52,201	42	44	14
2002	55,674	43	44	13
Avg	65,172	40	44	16

¹California Pear Advisory Board Annual Reports 1998 – 2002 ²Severe scab year

drop trailers for transport to a packing shed for cleaning, sorting, and packing. The grower also rents a forklift. The crop is harvested and hauled to the packinghouse by the grower.

Yields. 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 and off-grade generally receive lower prices than fresh market fruit so grower incentive is to produce for the fresh market

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. Based on the 5-year average (Table A), this study separates yields for the three different categories from gross tonnage as follows: fresh market, 40%; processed, 44%; and off-grade, 16%.

Returns. Growers are paid for fruit based on gross field tons for different grades. Estimated gross return prices per ton for the Bartlett Pear categories described above are: fresh market, \$622; processed, \$213; and off grade, \$50. The return prices are used to calculate ranging analysis for different yields and prices. The prices used in this cost study are estimated based on the following: Fresh market is a 2002 average from sheds and annual crop reports in the area, processed is an average based on 2003 prices, and off-grade is an assumed price based on a range of values for off-grade fruit.

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

Additionally, growers may pay a voluntary assessment to the California Pear Growers (CPG). The CPG uses the 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 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, the fresh market pears are packed in tight fill 36-pound boxes at \$6.00 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 \$9.00 and \$7.25 per hour for machine and non-machine workers, respectively. Adding 45% for the employers share of federal and state payroll taxes, insurance, and other benefits gives the labor rates shown of \$13.05 and \$10.51 per hour for machine labor and non- The overhead includes the employers' share of federal and California state payroll taxes, workers' compensation insurance for fruit orchards (code 0016), and a percentage for other possible benefits. Workers' compensation costs will vary among growers, but for this study the cost is based upon the average industry final rate as of January 1, 2003 (California Department of Insurance). Labor for operations involving machinery are 20% higher than the operation time given in Table 6 to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and field repair.

Table B. Assessments, California Pear Advisory Board
Bartlett Pears

Category	Price/Unit	Unit
Fresh Market		
Tight-fill carton	\$0.340	36 lb
Standard box	\$0.415	44-46 lb
Metric box	\$0.378	40 lb
LA lug	\$0.264	28 lb
Processed		
Unrestricted grades	\$4.00	ton
Restricted grade	\$1.50	ton
All other special products	\$1.50	ton

Equipment Operating Costs. Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by ASAE. Fuel and lubrication costs are also determined by ASAE equations based on maximum PTO horsepower, and fuel type. Prices for on-farm delivery of diesel and gasoline are \$1.11 and \$1.58 per gallon, respectively. The fuel prices are a January 2003 average based on four less than truckload California field delivery locations. The cost includes a 2.25% sales tax (effective September 2001) on diesel fuel and 7.25% sales tax on gasoline. Gasoline also includes federal and state excise tax, which can be refunded for on-farm use when filing your income tax. The fuel, lube, and repair cost per acre for each operation in Table 6 is determined by multiplying the total hourly operating cost in Table 11 for each piece of equipment used for the selected operation by the hours per acre. Tractor time is 10% higher than implement time for a given operation to account for setup, travel and down time.

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

Risk. The risks associated with 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 that 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.

Insurance. Insurance for farm investments varies depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.676% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$516 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 \$112 per month. This cost includes delivery and 8 months of weekly service.

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

Non-Cash Overhead

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

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

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

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

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

Irrigation System. 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.

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.

Puffer Cabinets/Programmer. The puffer is registered by Suterra LLC of Bend, Oregon. The puffer cabinet (dispenser) holds the aerosol canister. The dispenser emits a pheromone at preset intervals above a minimum ambient temperature threshold for 200 days. The programmer is for entering and checking the emission parameters. The puffer units should be checked periodically for proper emitting and done on an average of once per month. The grower purchases 1.5 cabinets per acre (first year rate) or 105 for 70 acres.

Worker Housing. Miscellaneous housing provided on the ranch to house field workers during harvest.

Land. Land values for pear orchards in the North Coast Region range from \$6,000 to \$10,000 per acre. Land in this study is valued at \$8,000 per acre or \$8,571 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 in *Sample Cost to Establish and Produce Pears, North Coast, 2002* represents the establishment cost per acre. For this study, this cost is \$10,024 per acre or \$701,680 for the 70-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 Table 10. Equipment costs are composed of three parts: non-cash overhead, cash overhead, and operating costs. Both of the overhead factors have been discussed in previous sections. The operating costs consist of repairs, fuel, and lubrication and are discussed under operating costs.

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

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UC COOPERATIVE EXTENSION
Table 1. TRANSITION COSTS PER ACRE to PRODUCE PEARS over 7 YEARS
NORTH COAST REGION - Lake County 2003

Operation	Total Labor & Material Costs per acre							
	Standard	Transition Year						
	1	2	3	4	5	6	7	
Cultural:								
Pest - Dormant (Dormant Oil)	32							
Pest - Dormant (415 Oil)		26	26	26	26	26	26	26
Pest - Delayed Dormant (415 Oil)	19							
Weed - Strip Spray (Goal, Roundup)	46	46	46	46	46	46	46	46
Pest - Gophers (Bait)	8	8	8	8	8	8	8	8
Pest - OBLR (Lorsban, Oil)		47	47	47	47	47	47	47
Weed - Mow Middles 7X	61	61	61	61	61	61	61	61
Pest - Scab (Ziram)	34	34	34	34	34	34	34	34
Weed - Strip Spray (Roundup)	8	8	8	8	8	8	8	8
Frost Protection - Sprinkle	84	84	84	84	84	84	84	84
Irrigate	96	96	96	96	96	96	96	96
Pest - Scab (Flint)	39	39	39	39	39	39	39	39
Pest - Psylla								
Pest - Blight (Agri-mycin, Mycoshield)	190	190	190	232	232	232	232	232
Pest - Blight/ Scab (Agri-mycin, Mycoshield)/(Flint)	75	75	75	75	75	75	75	75
Pest - Psylla/Mite (Agrimek, Oil)	302	201	201	101	101	101	201	101
Prune & Train Trees	819	819	819	819	819	819	819	819
Pest - Blight/Scab (Agri-mycin, Mycoshield)/(Syllit)	91	91	91	91	91	91	91	91
Pest - Blight/Codling Moth (Agri-mycin, Mycoshield)/(Guthion)	80	73						
Pest - Blight/Codling Moth (Agri-mycin, Mycoshield)/(Confirm)			80					
Pest - Codling Moth (Guthion)	88							
Pest - Codling Moth (Confirm)		44	44					44
Pest - Codling Moth/Psylla/Mite (Confirm)/(Oil)				57	57	57		
Fertilize - Nitrogen (Urea)	27	27	27	27	27	27	27	27
Pest - Codling Moth (Imidan)	61							
Weed - Strip Spray (Gramoxone)	9	9	9	9	9	9	9	9
Pest - Hang Puffers		145	145	145	118	103	103	118
Pest Control - Hang CM Traps (PCA)	1	5	5	5	5	5	5	5
Pest Control - Inspect Puffers		1	1	1	1	1	1	1
Pest Control - Reprogram Puffers		1	1	1	1	1	1	1
Pest Control - Check Traps (PCA)	1	7	7	7	7	7	7	7
Pest Control - Hang OBLR Traps (PCA)		1	1	1	1	1	1	1
Apply Hormone (Liqui-Stik)	31	31	31	31	31	31	31	31
PCA Fees	35	40	40	40	40	40	40	40
Leaf Analysis	19	19	19	19	19	19	19	19
Pickup Truck Use	84	84	84	84	84	84	84	84
ATV Use	71	71	71	71	71	71	71	71
TOTAL CULTURAL COSTS	2,411	2,383	2,390	2,265	2,238	2,223	2,266	2,225
CULTURAL COSTS/TON (20 Ton/acre)	121	119	120	113	112	111	113	111
Harvest:								
Harvest Fruit - 1st Pick	357	357	357	357	357	357	357	357
Harvest Fruit - 2nd Pick	713	713	713	713	713	713	713	713
Haul To Packinghouse	158	158	158	158	158	158	158	158
TOTAL HARVEST COSTS	1,228	1,228	1,228	1,228	1,228	1,228	1,228	1,228

*Blight sprays costs do not change, only methods and combinations different.

UC COOPERATIVE EXTENSION
Table 1. Continued

Operation	Total Labor & Material Costs per acre							
	Standard	Transition Year						
		1	2	3	4	5	6	7
Packing:								
Sort/Pack/Sell Fruit	3,048	3,048	3,048	3,048	3,048	3,048	3,048	3,048
TOTAL PACKING COSTS	3,048	3,048	3,048	3,048	3,048	3,048	3,048	3,048
Assessment:								
Assessments	215	215	215	215	215	215	215	215
TOTAL ASSESSMENT COSTS	215	215	215	215	215	215	215	215
Postharvest:								
Irrigate	80	80	80	80	80	80	80	80
Fertilize - Nitrogen (Urea)	27	27	27	27	27	27	27	27
Pest - Psylla (415 Oil)	19							
Pest - Rust Mites							65	65
TOTAL POSTHARVEST COSTS	126	107	107	107	107	107	172	172
Interest on operating capital @ 7.14%	101	104	105	103	102	101	100	101
TOTAL OPERATING COSTS/ACRE	7,129	7,085	7,093	6,966	6,938	6,922	7,029	6,989
TOTAL OPERATING COSTS/TON	356	354	355	348	347	346	351	349
Cash Overhead:								
Office Expense	44	44	44	44	44	44	44	44
Liability Insurance	7	7	7	7	7	7	7	7
Sanitation Fee	13	13	13	13	13	13	13	13
Property Taxes	162	160	160	160	160	160	160	160
Property Insurance	51	50	50	50	50	50	50	50
Investment Repairs	77	78	78	78	78	78	78	78
TOTAL CASH OVERHEAD COSTS	354	352	352	352	352	352	352	352
TOTAL CASH COSTS/ACRE	7,483	7,437	7,445	7,318	7,290	7,274	7,381	7,341
TOTAL CASH COSTS/TON	374	372	372	366	365	364	369	367
Non Cash Overhead:								
Buildings	57	57	57	57	57	57	57	57
Worker Housing	10	10	10	10	10	10	10	10
Fuel Tanks	4	4	4	4	4	4	4	4
Shop Tools	17	17	17	17	17	17	17	17
Sprinkler System	152	152	152	152	152	152	152	152
Ladders - 16 Each	4	4	4	4	4	4	4	4
Land	536	536	536	536	536	536	536	536
Pear Establishment	628	628	628	628	628	628	628	628
Puffer Cabinet 77		14	14	14	14	14	14	14
Puffer Programmer		1	1	1	1	1	1	1
Equipment	214	172	172	172	172	172	172	172
TOTAL NON-CASH OVERHEAD COSTS	1,622	1,595	1,595	1,595	1,595	1,595	1,595	1,595
TOTAL COSTS/ACRE	9,105	9,032	9,040	8,913	8,885	8,869	8,976	8,935
TOTAL COSTS/TON	455	452	452	446	444	443	449	447

UC COOPERATIVE EXTENSION
Table 2. TRANSITION COSTS AND RETURNS PER ACRE to PRODUCE PEARS over 7 Years
NORTH COAST REGION- Lake County- 2003

	Cost/ Unit	Unit	Standard		Year 1		Year 2		Year 3		Year 4		Year 5		Year 6		Year 7	
			Amt./ Acre	Cost/ Acre	Amt./ Acre	Cost/ Acre	Amt./ Acre	Cost/ Acre	Amt./ Acre	Cost/ Acre	Amt./ Acre	Cost/ Acre	Amt./ Acre	Cost/ Acre	Amt./ Acre	Cost/ Acre	Amt./ Acre	Cost/ Acre
GROSS RETURNS																		
Fresh	622.00	ton	8.00	4,976	8.00	4,976	8.00	4,976	8.00	4,976	8.00	4,976	8.00	4,976	8.00	4,976	8.00	4,976
Processed/Unrestricted	213.00	ton	8.80	1,874	8.80	1,874	8.80	1,874	8.80	1,874	8.80	1,874	8.80	1,874	8.80	1,874	8.80	1,874
Off-Grades/Restricted	50.00	ton	3.20	160	3.20	160	3.20	160	3.20	160	3.20	160	3.20	160	3.20	160	3.20	160
TOTAL GROSS RETURNS			20.00	7,010	20.00	7,010	20.00	7,010	20.00	7,010	20.00	7,010	20.00	7,010	20.00	7,010	20.00	7,010
OPERATING COSTS																		
Insecticide:																		
415/440 Oil	3.19	gal	8.00	26	12.00	38	12.00	38	15.00	48	15.00	48	15.00	48	12.00	38	11.00	35
Dormant Oil Plus	3.15	gal	11.00	35		0		0		0		0		0		0		0
Guthion 50W	12.50	lb	9.00	113	2.50	31		0		0		0		0		0		0
Imidan 70WSB	9.00	lb	6.00	54		0		0		0		0		0		0		0
Confirm	1.87	floz			20.00	37	40.00	75	20.00	37	20.00	37	20.00	37		0	20.00	37
Agri-Mek	7.57	oz	36.00	273	24.00	182	24.00	182	12.00	91	12.00	91	12.00	91	24.00	182	12.00	91
Lorsban 4E	6.86	pt		0	4.00	27	4.00	27	4.00	27	4.00	27	4.00	27	4.00	27	4.00	27
Herbicide:																		
Gramoxone Extra	4.66	pint	1.00	5	1.00	5	1.00	5	1.00	5	1.00	5	1.00	5	1.00	5	1.00	5
Goal	16.68	pint	2.00	33	2.00	33	2.00	33	2.00	33	2.00	33	2.00	33	2.00	33	2.00	33
Roundup Ultra	4.50	pint	3.00	14	3.00	14	3.00	14	3.00	14	3.00	14	3.00	14	3.00	14	3.00	14
Rodenticide:																		
Rodent Bait	3.59	lb	1.00	4	1.00	4	1.00	4	1.00	4	1.00	4	1.00	4	1.00	4	1.00	4
Fungicide:																		
Lime Sulfur Solution	5.39	gal	0.00	0		0		0		0		0		0	8.00	43	8.00	43
Sulfur DF	0.92	lb	0.00	0		0		0		0		0		0	16.00	15	16.00	15
Ziram WDG 76	3.39	lb	8.00	27	8.00	27	8.00	27	8.00	27	8.00	27	8.00	27	8.00	27	8.00	27
Flint	12.99	oz	5.00	65	5.00	65	5.00	65	5.00	65	5.00	65	5.00	65	5.00	65	5.00	65
Syllit 65W	16.19	lb	3.00	49	3.00	49	3.00	49	3.00	49	3.00	49	3.00	49	3.00	49	3.00	49
Antibiotic:																		
Mycoshield	22.79	lb	7.50	171	7.50	171	7.50	171	7.50	171	7.50	171	7.50	171	7.50	171	7.50	171
Agri-mycin 17	1.59	oz	60.00	95	60.00	95	60.00	95	60.00	95	60.00	95	60.00	95	60.00	95	60.00	95
Lures/Confusion:																		
Puffer Canister	90.00	each		0	1.60	144	1.60	144	1.60	144	1.30	117	1.13	102	1.13	102	1.30	117
Trap 1CP (Double Traps)	5.20	each	0.10	1	0.80	4	0.80	4	0.80	4	0.80	4	0.80	4	0.80	4	0.80	4
Lure CM 1X	1.94	each	0.30	1	2.40	5	2.40	5	2.40	5	2.40	5	2.40	5	2.40	5	2.40	5
Lure CM 10X	1.23	each	0.30	0	1.20	1	1.20	1	1.20	1	1.20	1	1.20	1	1.20	1	1.20	1
1CP Liner	1.06	each	0.60	1	0.60	1	0.60	1	0.60	1	0.60	1	0.60	1	0.60	1	0.60	1
Lure OBLR-W	1.94	each		0	1.00	2	1.00	2	1.00	2	1.00	2	1.00	2	1.00	2	1.00	2
Contract:																		
Pruning Crew	4.50	tree	182.00	819	182.00	819	182.00	819	182.00	819	182.00	819	182.00	819	182.00	819	182.00	819
Hand Pick	50.00	ton	20.00	1,000	20.00	1,000	20.00	1,000	20.00	1,000	20.00	1,000	20.00	1,000	20.00	1,000	20.00	1,000
PCA Fees	35.00	acre	1.00	35	1.00	40	1.00	40	1.00	40	1.00	40	1.00	40	1.00	40	1.00	40
Leaf Analysis	18.50	acre	1.00	19	1.00	19	1.00	19	1.00	19	1.00	19	1.00	19	1.00	19	1.00	19

UC COOPERATIVE EXTENSION
Table 2. Continued

	Cost/ Unit	Unit	Standard		Year 1		Year 2		Year 3		Year 4		Year 5		Year 6		Year 7	
			Amt./ Acre	Cost/ Acre	Amt./ Acre	Cost/ Acre	Amt./ Acre	Cost/ Acre	Amt./ Acre	Cost/ Acre	Amt./ Acre	Cost/ Acre	Amt./ Acre	Cost/ Acre	Amt./ Acre	Cost/ Acre	Amt./ Acre	Cost/ Acre
Water:																		
Water - Frost Protection	3.76	acin	18.00	68	18.00	68	18.00	68	18.00	68	18.00	68	18.00	68	18.00	68	18.00	68
Water - Pumped	3.76	acin	30.03	113	30.03	113	30.03	113	30.03	113	30.03	113	30.03	113	30.03	113	30.03	113
Fertilizer:																		
46-0-0 (Urea)	0.27	lb N	200.00	54	200.00	54	200.00	54	200.00	54	200.00	54	200.00	54	200.00	54	200.00	54
Growth Regulator																		
Liqui-Stik	1.00	oz	24.00	24	24.00	24	24.00	24	24.00	24	24.00	24	24.00	24	24.00	24	24.00	24
Rent:																		
Forklift Rental	14.50	acwk	2.00	29	2.00	29	2.00	29	2.00	29	2.00	29	2.00	29	2.00	29	2.00	29
Custom:																		
Pack - Fresh 36 lb box	6.00	box	444.00	2,664	444.00	2,664	444.00	2,664	444.00	2,664	444.00	2,664	444.00	2,664	444.00	2,664	444.00	2,664
Shed Cost - Processing	32.00	ton	12.00	384	12.00	384	12.00	384	12.00	384	12.00	384	12.00	384	12.00	384	12.00	384
Assessment:																		
Fresh Market -Pear	0.34	box	444.00	151	444.00	151	444.00	151	444.00	151	444.00	151	444.00	151	444.00	151	444.00	151
Processed - Unrestricted	4.00	ton	8.80	35	8.80	35	8.80	35	8.80	35	8.80	35	8.80	35	8.80	35	8.80	35
Processed - Restricted	1.50	ton	3.20	5	3.20	5	3.20	5	3.20	5	3.20	5	3.20	5	3.20	5	3.20	5
CA Pear Growers Association	2.00	ton	12.00	24	12.00	24	12.00	24	12.00	24	12.00	24	12.00	24	12.00	24	12.00	24
Labor (machine)	13.05	hrs	28.62	373	27.30	356	27.30	356	26.97	352	26.97	352	26.97	352	27.30	356	27.30	356
Labor (non-machine)	10.51	hrs	7.54	79	7.83	82	7.83	82	7.83	82	7.83	82	7.83	82	7.83	82	7.83	82
Fuel - Gas	1.58	gal	13.68	22	13.68	22	13.68	22	13.68	22	13.68	22	13.68	22	13.68	22	13.68	22
Fuel - Diesel	1.11	gal	67.06	74	63.79	71	63.79	71	62.98	70	62.98	70	62.98	70	63.79	71	63.79	71
Lube				14		14		14		14		14		14		14		14
Machinery repair				76		71		71		70		70		70		71		71
Interest on operating capital				101		104		105		102		102		102		102		101
TOTAL OPERATING COSTS/ACRE			7,127		7,083		7,091		6,963		6,936		6,920		7,028		6,986	
Total Operating Costs/ton			356		354		355		348		347		346		351		349	
NET RETURNS ABOVE OPERATING COSTS			-244		-201		-208		-80		-53		-38		-146		24	
TOTAL CASH OVERHEAD COSTS/ACRE			354		353		353		353		353		353		353		353	
TOTAL CASH COSTS/ACRE			7,481		7,436		7,444		7,316		7,289		7,273		7,381		7,339	
Total Cash Costs/ton			374		372		372		366		364		364		369		367	
TOTAL NON-CASH OVERHEAD COSTS/ACRE			1,622		1,596		1,596		1,596		1,596		1,596		1,596		1,596	
TOTAL COSTS/ACRE			9,103		9,032		9,040		8,912		8,885		8,869		8,977		8,935	
Total Costs/ton			455		452		452		446		444		443		449		447	
NET RETURNS ABOVE TOTAL COSTS/ACRE			-2,092		-2,022		-2,029		-1,901		-1,874		-1,859		-1,967		-1,925	

UC COOPERATIVE EXTENSION
Table 3. COST SAVINGS PER ACRE - CONVENTIONAL VERSUS TRANSITION YEARS
NORTH COAST REGION - Lake County 2003

Operation	Standard Cost	Transition Years							Total Cost Savings	Average Savings Per Year
		1	2	3	4	5	6	7		
TOTAL CULTURAL COSTS/ACRE	2,411	28	21	146	173	188	145	186	887	127
Total Cultural Costs/Ton based on 20 ton/acre	121	1	1	7	9	9	7	9	44	6
TOTAL OPERATING COSTS/ACRE	7,129	44	36	163	191	207	100	140	881	126
Total Operating Costs/Ton based on 20 ton/acre	356	2	2	8	10	10	5	7	44	6

UC COOPERATIVE EXTENSION
Table 4. SPRAY COMPARISONS CONVENTIONAL VERSUS TRANSITION YEARS
NORTH COAST REGION - Lake County 2003

Pest	Standard	Transition Years						
		1	2	3	4	5	6	7
		Number of Sprays						
Blight	9	9	9	10	10	10	10	10
Blight/Scab	2	2	2	2	2	2	2	2
Blight /Codling Moth	1	1	1	0	0	0	0	0
Codling Moth	3	1	1	0	0	0	0	1
Codling Moth/Psylla/Mites	0	0	0	1	1	1	0	1
Psylla/Mites	3	2	2	1	1	1	2	1
OBLR	0	1	1	1	1	1	1	1
Dormant	1	1	1	1	1	1	1	1
Delayed Dormant	1	0	0	0	0	0	0	0
Rust Mite	0	0	0	0	0	0	1	1

UC COOPERATIVE EXTENSION
Table 5. PUFFER OPERATION LABOR - UCCE
NORTH COAST REGION - Lake County 2003

OPERATION	Hours per acre (0.1 hr = 6 min)						
	Mar	Apr	May	Jun	Jul	Aug	Sep
Puffers :							
Hang Puffers	0.08						
Inspect Puffers	0.02	0.02	0.02	0.02	0.02	0.02	
Check Batteries and Emission					0.09		
Trapping:							
Hang CM Traps	0.10						
Hang OBLR Traps		0.07					
Take Down Traps							0.11
Change Lures		0.13	0.13	0.13	0.13	0.13	
Check Traps		0.14	0.37	0.40	0.28	0.29	0.11
Compile Weekly Counts		0.03	0.03	0.03	0.03	0.03	0.03
Egg Counts			0.05	0.05	0.05		
Fruit Sampling:*							
Check Tree Fruit				0.17	0.17		0.09
Check Ground Fruit					0.06		
Bin Counts						0.24	

*Sample sizes: Tree Fruit - 1,000 (June); 2,000 (July); 300 (Sept)
Ground Fruit - 500 (early July). Bin Counts - 1,000 (Aug)

UC COOPERATIVE EXTENSION
Table 6. COSTS PER ACRE to PRODUCE PEARS - Year 7
NORTH COAST REGION - Lake County 2003

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-Dormant Psylla, Mite, Scale (415 Oil)	0.28	4	2	19	0	26		
Weed-Strip Spray 3X (Goal, Roundup)	0.18	3	1	42	0	46		
Pest-Gophers 3X (Rodent Bait)	0.20	3	1	4	0	8		
Pest-Budbreak OBLR(Lorsban, Oil)	0.28	4	2	40	0	47		
Pest-Scab (Ziram)	0.28	4	2	27	0	34		
Pest-Scab (Flint)	0.28	4	2	32	0	39		
Pest-Scab/Blight(Flint/Mycoshield, Agri-Mycin)	0.28	4	2	68	0	75		
Weed-Mow Middles 7X	2.52	39	21	0	0	61		
Weed-Strip Spray 3X (Roundup)	0.18	3	1	5	0	8		
Frost Protection Irrigate	1.54	16	0	68	0	84		
Pest-Psylla/Mite (Agri-Mek, Oil)	0.28	4	2	94	0	101		
Pest-Blight Alt Rows(Mycoshield, Agri-Mycin)	1.51	24	13	195	0	232		
Prune & Train Trees	0.00	0	0	0	819	819		
Pest-Scab/Blight (Syllit/Mycoshield, Agri-Mycin)	0.28	4	2	84	0	91		
Irrigate	3.00	32	0	65	0	96		
Fertilize-Nitrogen (Urea)	0.00	0	0	27	0	27		
Pest-Codling Moth (Confirm)	0.28	4	2	37	0	44		
Weed-Strip Spray 3X (Gramoxne)	0.18	3	1	5	0	9		
Apply Hormone (Liqui Stik)	0.28	4	2	24	0	31		
PCA Fees	0.00	0	0	0	40	40		
Leaf Analysis	0.00	0	0	0	19	19		
Pickup Truck Use	3.80	60	24	0	0	84		
ATV Use	3.80	60	11	0	0	71		
Puffers-Hang 13/10acres	0.08	1	0	117	0	118		
Puffers-Inspect	0.12	1	0	0	0	1		
Puffers-Reprogram	0.09	1	0	0	0	1		
Traps CM-Hang 3/5 acres PCA	0.00	0	0	5	0	5		
Traps-Check/Change lures PCA	0.00	0	0	7	0	7		
Traps-Hang OBLR 1/5 acres PCA	0.00	0	0	1	0	1		
TOTAL CULTURAL COSTS	19.66	283	96	966	877	2,223		
Harvest:								
Harvest Fruit-1st Pick	0.32	10	3	0	343	357		
Harvest Fruit-2nd Pick	0.64	20	7	0	686	713		
Haul To Packinghouse	5.72	90	69	0	0	158		
TOTAL HARVEST COSTS	6.68	120	79	0	1,029	1,228		
Packing:								
Sort/Pack/Sell Fruit	0.00	0	0	0	3,048	3,048		
TOTAL PACKING COSTS	0.00	0	0	0	3,048	3,048		
Assessments	0.00	0	0	215	0	215		
TOTAL ASSESSMENT COSTS	0.00	0	0	215	0	215		
Postharvest:								
Irrigate	3.00	32	0	48	0	80		
Fertilize-Nitrogen (Urea)	0	0	0	27	0	27		
Pest-Rust Mite	0	4	2	58	0	65		
TOTAL POSTHARVEST COSTS	3	36	2	133	0	172		
Interest on operating capital @ 7.14%						101		
TOTAL OPERATING COSTS/ACRE		439	177	1,315	4,954	6,985		
Cash Overhead:								
Office Expense						44		
Liability Insurance						7		
Sanitation Fee						13		
Property Taxes						160		
Property Insurance						50		
Investment Repairs						78		
TOTAL CASH OVERHEAD COSTS						353		
TOTAL CASH COSTS/ACRE						7,357		

UC COOPERATIVE EXTENSION
Table 6. Continued

Operation	Operation Time (Hrs/A)	Cash and Labor Cost per acre				Total Cost	Your Cost
		Labor Cost	Fuel,Lube & Repairs	Material Cost	Custom/ Rent		
Non-Cash Overhead:		Producing Acre		Annual Cost Capital Recovery			
Buildings		638		57		57	
Worker Housing		117		10		10	
Fuel Tanks		50		4		4	
Shop Tools		171		17		17	
Sprinkler System		1,894		152		152	
Ladders - 16 Each		31		4		4	
Land		8,571		536		536	
Pear Establishment		10,024		628		628	
Puffer Cabinets (77)		60		14		14	
Puffer Programmer		5		1		1	
Equipment		1,472		172		172	
TOTAL NON-CASH OVERHEAD COSTS		23,035		1,596		1,596	
TOTAL COSTS/ACRE						8,934	

UC COOPERATIVE EXTENSION
Table 7. COSTS AND RETURNS PER ACRE to PRODUCE PEARS – Year 7
NORTH COAST REGION- Lake County - 2003

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Fresh	8.00	ton	622.00	4,976	
Processing	8.80	ton	213.00	1,874	
Off-Grades	3.20	ton	50.00	160	
TOTAL GROSS RETURNS				7,010	
OPERATING COSTS					
Insecticide:					
415 Oil	11.00	gal	3.19	35	
Lorsban 4 E	4.00	pint	6.86	27	
Agri-Mek 0.15 EC	12.00	oz	7.57	91	
Confirm	20.00	floz	1.87	37	
Herbicide:					
Goal 2XL	2.00	pint	16.68	33	
Roundup Ultra	3.00	pint	4.50	14	
Gramoxone Extra	1.00	pint	4.66	5	
Rodenticide:					
Rodent Bait	1.00	lb	3.59	4	
Fungicide:					
Ziram WDG 76	8.00	lb	3.39	27	
Flint	5.00	oz	12.99	65	
Syllit 65W	3.00	lb	16.19	49	
Lime Sulfur Solution	8.00	gal	5.39	43	
Thiolux (Sulfur)	16.00	lb	0.92	15	
Antibiotic:					
Mycoshield	7.50	lb	22.79	171	
Agri-mycin 17	60.00	oz	1.59	95	
Water:					
Water - Frost Protection	18.00	acin	3.76	68	
Water - Pumped	30.03	acin	3.76	113	
Contract:					
Pruning Crew	182.00	tree	4.50	819	
Pack (36# box)	444.00	box	6.00	2,664	
Shed –Processed Fruit Charge	12.00	ton	32.00	384	
PCA Fees	1.00	acre	40.00	40	
Leaf Analysis	1.00	acre	18.50	19	
Fertilizer:					
46-0-0 (Urea)	200.00	lb N	0.27	54	
Growth Regul:					
Liqui-Stik	24.00	floz	1.00	24	
Custom:					
Harvest-Hand+OH	20.00	ton	50.00	1,000	
Rent:					
Forklift Rental	2.00	acwk	14.50	29	
Assessment:					
CPAB Fresh Box	444.00	box	0.34	151	
Processed - Unrestricted	8.80	ton	4.00	35	
Processed - Restricted	3.20	ton	1.50	5	
CA Pear Grower Association	12.00	ton	2.00	24	
Lures/Confusion:					
Puffer Canister	1.30	each	90.00	117	
Trap 1CP (2 traps)	0.80	each	5.20	4	
Lure CM 1X	2.40	each	1.94	5	
Lure CM 10X	1.20	each	1.23	1	
1CP liner	0.60	each	1.06	1	
Lure OBLR-W	1.00	each	1.94	2	

UC COOPERATIVE EXTENSION
Table 7. Continued

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
Labor (machine)	27.30	hrs	13.05	356	
Labor (non-machine)	7.83	hrs	10.51	82	
Fuel - Gas	13.68	gal	1.58	22	
Fuel - Diesel	63.79	gal	1.11	71	
Lube				14	
Machinery repair				71	
Interest on operating capital				101	
TOTAL OPERATING COSTS/ACRE				6,985	
TOTAL OPERATING COSTS/TON				873	
NET RETURNS ABOVE OPERATING COSTS				25	
CASH OVERHEAD COSTS:					
Office Expense				44	
Liability Insurance				7	
Sanitation Fee				13	
Property Taxes				160	
Property Insurance				50	
Investment Repairs				78	
TOTAL CASH OVERHEAD COSTS/ACRE				353	
TOTAL CASH COSTS/ACRE				7,338	
TOTAL CASH COSTS/TON				917	
NON-CASH OVERHEAD COSTS					
Buildings				57	
Worker Housing				10	
Fuel Tanks 2-500g				4	
Shop Tools				17	
Sprinkler System				152	
Ladders - 16 Each				4	
Land				536	
Pear Establishment				628	
Puffer Cabinets				14	
Puffer Programmer				1	
Equipment				172	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				1,596	
TOTAL COSTS/ACRE				8,934	
TOTAL COSTS/TON				1,117	
NET RETURNS ABOVE TOTAL COSTS				-1,924	

UC COOPERATIVE EXTENSION
Table 8. MONTHLY CASH COSTS PER ACRE to PRODUCE PEARS – Year 7
NORTH COAST REGION - Lake County - 2003

Beginning JAN 03	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Ending DEC 03	03	03	03	03	03	03	03	03	03	03	03	03	
Cultural:													
Pest-Dormant (415) Psylla Mite Scale	26												26
Weed-Strip Spray (Goal Roundup)		46											46
Pest-Gophers 3X (Rodent Bait)			8										8
Pest-Budbreak OBLR (Lorsban, Oil)			47										47
Pest-Scab (Ziram)			34										34
Pest-Scab (Flint)			39										39
Pest-Scab/Blight(Flnt/Mycshld AgrMycn)				75									75
Weed-Mow Middles 7X			9	9	9	17	17						61
Weed-Strip Spray 3X (Roundup)				8									8
Frost Protection Irrigate				42	42								84
Pest-Psylla/Mite (AgriMek Oil)				101									101
Pest-Blight Alt Rows (AgMycn Mycshld)				106	127								232
Prune & Train Trees	819												819
Pest-Scab/Blight(Syllit/AgMycn Mycshld)					91								91
Irrigate						48	48						96
Fertilize-Nitrogen (Urea)						27							27
Pest-Codling Moth (Confirm)						44							44
Weed-Strip Spray (Gramoxone)							9						9
Apply Hormone (Liqui Stik)								31					31
PCA Fees	4	4	4	4	4	4	4	4	4	4			40
Leaf Analysis							19						19
Pickup Truck Use	7	7	7	7	7	7	7	7	7	7	7	7	84
ATV Use	6	6	6	6	6	6	6	6	6	6	6	6	71
Puffers-Hang 13/10 acres			118										118
Puffers-Inspect			1	0	0	0							1
Puffers-Reprogram							1						1
Traps CM-Hang 3/5 acres PCA (Traps)			5										5
Traps-Check/Change lures PCA (Lures)				1	1	1	1	1					7
Traps-Hang OBLR 1/5 acres PCA (Traps)				1									1
TOTAL CULTURAL COSTS	862	63	277	360	287	154	111	49	17	17	13	13	2,223
Harvest:													
Harvest Fruit-1st Pick								357					357
Harvest Fruit-2nd Pick								713					713
Haul To Packinghouse								158					158
TOTAL HARVEST COSTS								1,228					1,228
Packing:													
Sort/Pack/Sell Fruit								3,048					3,048
TOTAL PACKING COSTS								3,048					3,048
Assessment:													
Assessments								215					215
TOTAL ASSESSMENT COSTS								215					215
Postharvest:													
Irrigate								53	27				80
Fertilize-Nitrogen (Urea)									27				27
Pest-Rust Mite										65			65
TOTAL POSTHARVEST COSTS								53	54	65			172
Interest on operating capital	5	6	7	9	11	12	13	40	-1	-1	0	0	101
TOTAL OPERATING COSTS/ACRE	867	69	284	369	298	166	123	4633	70	81	13	13	6985
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	1			13
Property Taxes	80							80					160
Property Insurance	25							25					50
Investment Repairs	7	7	7	7	7	7	7	7	7	7	7	7	78
TOTAL CASH OVERHEAD COSTS	124	12	12	12	12	12	116	12	12	12	10	10	353
TOTAL CASH COSTS/ACRE	990	80	296	381	310	178	240	4644	81	92	23	23	7338

UC COOPERATIVE EXTENSION
Table 9. RANGING ANALYSIS USING PUFFERS – Year 7
NORTH COAST REGION – Lake County 2003

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE PEARS

	YIELD (tons/acre)						
	14.00	16.00	18.00	20.00	22.00	24.00	26.00
OPERATING COSTS/ACRE:							
Cultural Cost	2,223	2,223	2,223	2,223	2,223	2,223	2,223
Harvest Cost	958	1,048	1,138	1,228	1,318	1,408	1,498
Postharvest Cost	172	172	172	172	172	172	172
Packing Cost	2,134	2,438	2,743	3,048	3,353	3,658	3,962
Assessment Cost	150	172	193	215	236	258	279
Interest on operating capital	93	96	98	101	103	106	108
TOTAL OPERATING COSTS/ACRE	5,730	6,149	6,567	6,987	7,405	7,825	8,242
TOTAL OPERATING COSTS/ton	409	384	365	349	337	326	317
CASH OVERHEAD COSTS/ACRE	353	353	353	353	353	353	353
TOTAL CASH COSTS/ACRE	6,083	6,502	6,920	7,340	7,758	8,178	8,595
TOTAL CASH COSTS/ton	435	406	384	367	353	341	331
NON-CASH OVERHEAD COSTS/ACRE	1,596	1,596	1,596	1,596	1,596	1,596	1,596
TOTAL COSTS/ACRE	7,679	8,098	8,516	8,936	9,354	9,774	10,191
TOTAL COSTS/ton	549	506	473	447	425	407	392

UC COOPERATIVE EXTENSION
Table 9. continued

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE (\$/ton)			YIELD (tons/acre)						
			5.60	6.40	7.20	8.00	8.80	9.60	10.40
	Processing		6.16	7.04	7.92	8.80	9.68	10.56	11.44
		Off-Grades	2.24	2.56	2.88	3.20	3.52	3.84	4.16
322.00	173.00	30.00	-2,794	-2,793	-2,792	-2,793	-2,791	-2,792	-2,789
422.00	183.00	35.00	-2,161	-2,070	-1,978	-1,889	-1,797	-1,707	-1,614
522.00	193.00	45.00	-1,517	-1,334	-1,150	-969	-785	-603	-418
622.00	213.00	50.00	-823	-541	-258	23	306	587	872
722.00	223.00	55.00	-190	183	556	927	1,301	1,672	2,047
822.00	233.00	65.00	454	919	1,384	1,847	2,313	2,776	3,243
922.00	243.00	70.00	1,087	1,642	2,198	2,751	3,307	3,861	4,418

NET RETURNS PER ACRE ABOVE CASH COSTS

PRICE (\$/ton)			YIELD (tons/acre)						
			5.60	6.40	7.20	8.00	8.80	9.60	10.40
	Fresh		5.60	6.40	7.20	8.00	8.80	9.60	10.40
		Processing	6.16	7.04	7.92	8.80	9.68	10.56	11.44
		Off-Grades	2.24	2.56	2.88	3.20	3.52	3.84	4.16
322.00	173.00	30.00	-3,147	-3,146	-3,145	-3,146	-3,144	-3,145	-3,142
422.00	183.00	35.00	-2,514	-2,423	-2,331	-2,242	-2,150	-2,060	-1,967
522.00	193.00	45.00	-1,870	-1,687	-1,503	-1,322	-1,138	-956	-771
622.00	213.00	50.00	-1,176	-894	-611	-330	-47	234	519
722.00	223.00	55.00	-543	-170	203	574	948	1,319	1,694
822.00	233.00	65.00	101	566	1,031	1,494	1,960	2,423	2,890
922.00	243.00	70.00	734	1,289	1,845	2,398	2,954	3,508	4,065

NET RETURNS PER ACRE ABOVE TOTAL COSTS

PRICE (\$/ton)			YIELD (tons/acre)						
			5.60	6.40	7.20	8.00	8.80	9.60	10.40
	Fresh		5.60	6.40	7.20	8.00	8.80	9.60	10.40
		Processing	6.16	7.04	7.92	8.80	9.68	10.56	11.44
		Off-Grades	2.24	2.56	2.88	3.20	3.52	3.84	4.16
322.00	173.00	30.00	-4,743	-4,742	-4,741	-4,742	-4,740	-4,741	-4,738
422.00	183.00	35.00	-4,110	-4,019	-3,927	-3,838	-3,746	-3,656	-3,563
522.00	193.00	45.00	-3,466	-3,283	-3,099	-2,918	-2,734	-2,552	-2,367
622.00	213.00	50.00	-2,772	-2,490	-2,207	-1,926	-1,643	-1,362	-1,077
722.00	223.00	55.00	-2,139	-1,766	-1,393	-1,022	-648	-277	98
822.00	233.00	65.00	-1,495	-1,030	-565	-102	364	827	1,294
922.00	243.00	70.00	-862	-307	249	802	1,358	1,912	2,469

UC COOPERATIVE EXTENSION
**Table 10. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT,
and BUSINESS OVERHEAD COSTS – Year 7**
NORTH COAST REGION 2003

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
						Insur- ance	Taxes	
03	3 Point Forks #1	670	15	64	67	2	4	74
03	3 Point Forks #2	670	15	64	67	2	4	74
03	55 HP 2WD Tractor #2	32,269	12	8,068	3,431	136	202	3,769
03	55 HP 2WD Tractor #1	32,269	12	8,068	3,431	136	202	3,769
03	ATV 4WD	7,430	10	1,314	923	30	44	996
03	Bait Applicator	1,046	10	185	130	4	6	140
03	Mower - Flail 9'	7,372	10	1,304	916	29	43	988
03	Orch.Sprayer 500 Gallon	19,741	10	3,491	2,452	79	116	2,647
03	Pickup Truck 1/2 Ton	24,500	7	9,294	3,329	114	169	3,612
03	Truck - 10 Ton	41,827	10	12,355	4,824	183	271	5,278
03	Weed Sprayer 100 Gallon	3,947	10	698	490	16	23	529
TOTAL		171,741		44,905	20,060	732	1,083	21,876
60% of New Cost *		103,045		26,943	12,036	439	650	13,125

*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		3,976	151	223	894	5,245
Fuel Tanks 2-500g	3,500	25	350	274	13	19	70	376
Ladders - 16	2,196	10	220	285	8	12	44	350
Land	600,000	95	600,000	37,500	0	6,000	0	43,500
Pear Establishment	701,680	95		43,994	2,372	3,508	0	49,874
Puffer Cabinets (105)	4,200	5		1,004	0	0	84	1,088
Puffer Programmer	350	5		84	0	0	7	91
Shop Tools	12,000	15	1,133	1,208	44	66	240	1,558
Sprinkler System	132,555	25		10,617	448	663	3,973	15,701
Worker Housing	8,217	20		731	28	41	164	964
TOTAL INVESTMENT	1,509,391		601,703	99,673	3,064	10,533	5,476	118,746

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 11. HOURLY EQUIPMENT COSTS – Year 7
NORTH COAST REGION – Lake County 2003

Yr	Description	COSTS PER HOUR							Total Costs/Hr.
		Actual Hours Used	Capital Recovery	Cash Overhead		Operating			
				Insur- ance	Taxes	Repairs	Fuel & Lube	Total Oper.	
03	3 Point Forks #1	67.20	0.60	0.02	0.03	0.00	0.10	0.75	0.76
03	3 Point Forks #2	67.20	0.60	0.02	0.03	0.00	0.10	0.75	0.76
03	55 HP 2WD Tractor #2	73.90	27.85	1.11	1.64	3.45	4.88	35.47	36.21
03	55 HP 2WD Tractor #1	652.10	3.16	0.13	0.19	3.45	4.88	8.35	9.15
03	ATV 4WD	292.60	1.89	0.06	0.09	1.82	2.71	4.76	4.20
03	Bait Applicator	14.00	5.57	0.18	0.26	0.00	0.40	6.41	6.46
03	Mower - Flail 9'	176.30	3.12	0.10	0.15	0.00	3.05	6.41	6.43
03	Orchard Sprayer 500 Gallon	298.40	4.93	0.16	0.23	0.00	3.34	8.66	9.73
03	Pickup Truck 1/2 Ton	266.00	7.51	0.26	0.38	4.54	6.33	14.48	14.34
03	Truck - 10 Ton	400.40	7.23	0.27	0.41	7.98	11.98	19.89	21.03
03	Weed Sprayer 100 Gallon	37.00	7.96	0.25	0.38	0.00	1.06	9.65	9.71