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1998

UNIVERSITY OF CALIFORNIA - COOPERATIVE EXTENSION

SAMPLE COSTS TO  
ESTABLISH A PECAN ORCHARD AND PRODUCE

~ *PECANS* \_



**SOUTHERN SAN JOAQUIN VALLEY**  
**Flood Irrigated**

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### INTRODUCTION

The detailed costs to establish a pecan orchard and produce pecans in the Southern San Joaquin Valley are presented in this study. The hypothetical farm used in this report is 60 acres, 55 of which are in pecan production.

This study consists of assumptions for establishing a pecan orchard and producing pecans, and eight tables, and is intended as a guide only. It can be used to make production decisions, determine potential returns, prepare budgets and evaluate production loans. 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 on Table 2 Costs Per Acre to Produce Pecans and Table 3 Costs and Returns Per Acre To Produce Pecans.

Tables included:

- Table 1. Costs Per Acre To Establish A Pecan Orchard
- Table 2. Costs Per Acre To Produce Pecans
- Table 3. Costs And Returns Per Acre To Produce Pecans
- Table 4. Monthly Cash Costs Per Acre To Produce Pecans
- Table 5. Whole Farm Annual Equipment Overhead, Investment And Business Overhead Costs
- Table 6. Hourly Equipment Costs
- Table 7. Ranging Analysis
- Table 8. Cost and Returns/Breakeven Analysis

This and other costs studies can be obtained through the Department of Agricultural and Resource Economics, U.C. Davis (530-752-1515), or from selected county Cooperative Extension offices. For an explanation of calculations or assumptions used in this study refer to the attached General Assumptions or call the Department of Agricultural and Resource Economics, Cooperative Extension, University of California, Davis, California, (530-752-3589) or the farm advisor in the county of interest.

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### ASSUMPTIONS

The following are assumptions pertaining to sample costs of establishing a pecan orchard and producing pecans using flood irrigation in the Southern San Joaquin Valley. Practices described are not recommendations by the University of California, but represent production procedures and materials considered typical of a well managed orchard for the Southern San Joaquin Valley. Costs and practices detailed in this study may not be applicable to all situations. Establishment and cultural practices vary by grower and region; variations can be significant. These costs are 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.*

**Land.** This report is based on a 60 acre farm of which 55 acres are producing pecans. The remaining five acres are occupied by roads, irrigation systems and farmstead. Property costs \$5,000 per acre. Because only 55 of the 60 acres is planted with pecans land is valued at \$5,455 per producing acre. Land is not depreciated. The orchard is farmed by the owner; additional management costs ranging from \$60 to \$100 per acre occur if practices are contracted.

**Trees.** The specific varieties of pecan trees planted in this study are not specified. A few of the cultivars representing the majority of pecan acreage in California that might be planted include Wichita, Cheyenne, Western Schley, and Pawnee. All orchards will include two varieties in which pollen shedding and bloom periods coincide so that adequate pollination is insured. The trees are planted at an initial spacing of 30' X 30', 48 trees per acre. In the ninth year the orchard is thinned to half the original number of trees. The cost of tree removal is prorated over the remaining 31 years the orchard is in production. Pecan 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 40 years.

**Irrigation System.** The orchard is irrigated using a flood irrigation system. Water is delivered to the orchard from the district ditch and distributed through to the orchard by way of underground mainlines and valves. The life of the irrigation system is estimated at 40 years. The irrigation system is installed before the orchard is planted. The irrigation system is considered an improvement to the property and is shown in the capital recovery sections of Tables 1-3 as capital recovery costs and the Annual Investments portion of Table 5.

**Labor.** Hourly wages for workers are \$8.75, and \$5.75 per hour for skilled, and field workers respectively. Adding 34% for Workers Compensation, Social Security, Medicare insurance, and other possible benefits gives the labor rates shown of \$11.73 per hour for skilled labor, and \$7.71 per hour for field labor. The labor for operations involving machinery are 20% higher than the operation time given in Table 2 to account for the extra labor involved in equipment set up, moving, maintenance, and repair.

## Orchard Establishment Cultural Practices and Material Inputs

This orchard is established on ground that has been previously planted to other field or row crops. The land is assumed to be deep, well drained, and either a class I or II soil. The orchard site allows for a uniform water flow (i.e. flood or furrow irrigation).

**Site Preparation.** Land preparation begins with deep ripping or slip plowing the soil profile to 5 to 6 feet in order to break up any underlying hardpan or mix stratified soils which would affect root and water penetration. Ripping is performed by contract operators. Following ripping or slip plowing the ground is disced twice which helps to break up large clods of soil and smooth the ground in advance of planting the trees. The ground is then leveled flat so high and low spots are removed in order to allow for efficient irrigation. Although all operations that prepare the orchard for planting are done in the year prior to planting, these costs are included in the first year's expense.

**Planting.** Planting the orchard starts by marking tree sites, digging holes, and planting trees. Later trunks are treated with white, water-based paint to protect from sunburn. New trees are topped soon after planting so that trunk development is encouraged. Regular pruning begins in the second year and hours required to perform this task as well as costs increase annually. Pruning is performed in the winter months. In the second year, 0.5% of the trees or 1 trees per acre will have to be replaced.

**Irrigation.** Water cost for irrigation is a blend of district and pumped water. Price per acre foot for water will vary from grower to grower in this region depending on particular irrigation district, and/or various well characteristics, and other irrigation factors. In this study, water is calculated to cost \$35.04 per acre foot. The amount of water applied to the orchard during the establishment period varies each year and is shown in Table A below.

Table A	Pecan water use for establishment and production years	
Year	Acre-Inches/Year	Annual Cost/Acre
1	20	58.40
2	20	58.40
3	48	140.16
4+	56	163.52

Water is delivered to the orchard in furrows along the tree rows during the first two years. At the end of the second year borders are made and starting in the third season, water is flooded between the tree rows. The life of the irrigation system is estimated at 40 years. No assumption is made about effective rainfall.

**Fertilization.** Nitrogen is the major nutrient required for proper tree growth and optimum yields. Nitrogen fertilizer is applied in a liquid form, UN 32 (32% nitrogen) through the irrigation water in the first four years and with a tractor drawn fertilizer applicator from the fifth year on. Annual rates of actual N are shown in Table B.

Table B. Applied nitrogen for establishment and production years

Year	Pounds of N/Acre	Gallons of UN-32/Acre
1	6	1.1
2	20	5.6
3	30	8.5
4	50	14.1
5	100	28.2
6	100	28.2
7+	150	42.2

Zinc is supplied to the trees with four regularly applied foliar sprays. Zinc sulfate is mixed with a low biuret (LB) urea to make up the foliar zinc spray. Ground fertilization with zinc is not effective.

**Pest Management.** Chemical weed control for the orchard begins in spring of the first year using a contact herbicide, Roundup- to manage emerged weeds as a 'spot spray' where needed. In the second fall a residual herbicide is sprayed on tree rows. Tillage and mowing of row middles helps manage vegetation in the middle of the orchard floor. Discing and mowing are the mechanical weed control practice used in this study, though orchard cultivators or other tillage equipment might also be used. Discing is practice during the first two years and beginning in the third mowing is used for weed control in the row middles.

During the developmental years, pest control is minimal and in this study, not begun until the fourth year. Yellow and black aphids are the only economic insect pests of pecans in California. It is assumed that black aphids become a problem that require a treatment in the fourth year and each year thereafter. Several insecticides are available for black aphid control. No disease plague pecans in California.

**Establishment Cost.** The establishment cost is the sum of cash costs for land preparation, planting, trees, production expenses, and cash overhead for growing pecan trees through the first year nuts are harvested minus any returns from production. The *Total Accumulated Net Cash Cost* in the third year shown in Table 1, represents the establishment cost per acre. For this study, the cost is \$4,062 per acre or \$233,410 for the 55 acres planted to pecans. Establishment cost is amortized over the remaining 36 years that the orchard is assumed to be in production to determine the annual capital recovery expense for production years in Tables 2,3, and 5.

### Production Cultural Practices and Material Inputs

Cultural practices for the production of pecans vary by grower and region. The practices and inputs used in this cost study serve only as a sample or guide. Variations can be significant. For additional information contact the farm advisor in the county of interest.

**Pruning.** In this study, pruning is done during the winter months with the use of mechanical towers. Prunings are placed in the row middles, pushed out of the orchard by a tractor using a brush rake, and burned.

**Tree Spacing.** The pecan trees in this study are planted at a higher density than is optimal at maturity. Thinning out half of the trees occurs in the ninth year. Final spacing will be 42.4' X 42.4' (24 trees per acre). Revenue is realized from the sale of the wood (as firewood) which offsets most of the cost of the removal. The thinning (tree removal) in Tables 2, 3, and 5 is shown as an annual capital recovery cost over the remaining 31 years (40 year life minus 9 years of growth).

**Fertilization.** Tree nitrogen status is determined by leaf analysis; sampling for analysis is done in July. Nitrogen is applied at a rate of 150 pounds of N per acre. Fertilizer is in a liquid form (UN 32 - 32% nitrogen) and applied in April during irrigation. Zinc is applied as a foliar spray four times over May, June, July, and August. Zinc sulfate is mixed with a low biuret urea each time.

**Weed Control.** Weeds in mature orchards are controlled with the same combination of chemical and cultural (mowing) practices as one being established. Pre-emergent weeds are controlled in the tree row during the fall by a strip spray of residual herbicide mix. Persistent or perennial weeds that are not controlled by the fall residual spray receive 3 spot sprays of a contact herbicide.

**Insect Management.** Yellow and black aphids are the only economic insect pests of pecans in California. Yellow aphids are not treated because they have become resistant to insecticides and no other control method is available. An application of insecticide is made in July, August, or September to control black aphids.

Written recommendations are required for many pesticides and are made by licensed pest control advisors. Pesticides, rates, and cultural pest management practices mentioned in this cost study are listed in the UC IPM Pest Management Guidelines: Pecan. For information and pesticide use permits, contact the local county Agricultural Commissioner's office.

**Harvest.** Harvest starts in the fourth year after the orchard is planted depending on variety. The first year the orchard yields pecans they are hand harvested because the trees are not large enough to tolerate mechanical harvesting. In years five and six a catching frame that contains a shaker is used to harvest the crop before the trees are too large for such a practice. From year seven on the crop is harvested with a shaker, sweeper, and pickup machine. In this cost study, the crop is harvested and hauled by a contracted harvesting company, although some growers harvest their pecans themselves. All costs for contracted harvest operations are charged on per acre basis. The nuts are hulled and dried at a commercial plant. Drying costs are paid by the grower.

Mature pecan orchards are harvested twice. The first pick usually collects 80% of the nuts and the second pick harvests the remaining pecans about two to three weeks later. Mechanical harvesting begins by shaking the tree trunk to drop the nuts. The sweeper windrows the pecans into the orchard row middles and are picked up by a mechanical harvester and dumped into field trailers. The pecans are hauled from the field to a dehydrator for drying. After drying, the pecans are sold to processors.

For growers who own harvesting and/or processing equipment, the equipment used for harvesting operations should be added to the equipment and investment inventories on Table 5 and custom harvest charges should be replaced in Harvest costs in Tables 1 and 2, with the cost of grower performed harvest and hauling costs. The issues and appropriate method of analysis are discussed in Acquiring Alfalfa Hay Harvest Equipment: A Financial Analysis of Alternatives (Blank, et. al.).

**Yields and Returns.** Tulare County produce most of the reported pecans grown in California. California ranks twelfth in pecan production in the United States. Pecans yields and prices vary annually. Yields over the previous five years are shown in Table C. The annual average prices received by growers are also shown in Table C.

Table C. Pecan annual yields and prices received by county, 1993-1997

County	1993	1994	1995	1996	1997
----- tons/acre -----					
Fresno	1.10	NA	NA	NA	NA
Tulare	0.55	0.62	0.89	0.22	1.20
----- \$/ton -----					
Fresno	1,801	NA	NA	NA	NA
Tulare	2,420	2,839	2,619	1,279	2,120

Source: CDFA, State Crop Reports, 1993 - 1997.

Pecans most often begin bearing an economic crop in the fourth year after planting. Yield maturity is reached by the ninth or tenth year. Typical annual yields for the more common varieties are measured in clean, dry, inshell pounds per acre and are shown in Table D. Yields are from the fourth year to maturity. Once mature, pecans show a tendency for alternate bearing; i.e. a heavy crop followed by more modest crops. An estimated price of a \$1.10 per pound is used in this study to determine potential profits/losses. The yields and prices used in this cost study are estimates considering current situations. Table 7 shows income, costs, and net returns at varying yields and prices.

Table D. Annual yield per acre

Year	Dry, inshell pounds/acre
4	80
5	300
6	600
7	800
8	1,500
9+	1,700

**Risk.** The risks associated with producing and marketing pecans 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 pecan production. A market channel should be determined before pecans are planted and brought into production.

### 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, and investment repairs. Cash overhead costs are included in Tables 1-5.

*Property Taxes.* Counties charge a base property tax at the rate of 1% on the assessed value of the property including land, equipment, buildings, and improvements. In some counties special assessment districts exist and charge additional taxes on property. 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. Land value is assumed to remain unchanged.

*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 10.46% per year. This interest rate is the going market cost of borrowed funds. The interest cost of operations after the first harvest are discounted back to the first harvest month using a negative interest charge.

*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 0.713% of the average value of the assets over their useful life. Property insurance costs \$62 per acre. Liability insurance covers accidents on the farm and costs \$455 for the entire farm or \$7.58 per acre.

*Office Expense:* Office and business expenses are estimated at \$98 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, road maintenance, etc.

*Sanitation Services* Sanitation services provide portable toilets for the orchard and cost the farm \$256 annually or \$5 per acre. This cost includes delivery and servicing of toilets.

**Capital Recovery.** The capital recovery cost for equipment and other farm investments is calculated as the current purchase price for new equipment and then adjusts the price to 60% of new cost to indicate a mix of new and used equipment. Annual ownership costs for equipment and investments are shown in the capital recovery section of Tables 1, 2, 3, and 5 on an annual per acre basis.

Capital recovery cost 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 downpayment 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.

The calculation for 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 market value of an investment at the end of its useful life. It is calculated differently for different investments. For farm machinery (e.g., tractors and implements) the remaining value is a percentage of the new cost of the investment. Salvage value is calculated as

$$\text{New Price} \times \% \text{Remaining Value}$$

Salvage value for other investments including irrigation systems, buildings, and miscellaneous equipment is zero. The salvage value for land is equal to the purchase price because land does not depreciate. Salvage value for investments can vary. 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. It is the function of the interest rate and years of life of the equipment.



*Interest Rate.* The interest rate of 7.81% 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 real 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, not including inflation. In other words, the next best alternative use for these resources is in another agricultural enterprise.

**Equipment Costs.** Equipment costs are composed of three parts; capital recovery, 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.

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. The fuel and repair cost per acre for each operation in Table 1 is determined by multiplying the total hourly operating cost in Table 8 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 for a given operation to account for setup, travel and down time. Prices for on-farm delivery of diesel and gasoline are \$0.78 and \$1.22 per gallon, respectively.

**Acknowledgment.** Appreciation is expressed to the cooperators who provided information for this study.

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Table 1.

SAMPLE COSTS PER ACRE TO ESTABLISH A PECAN ORCHARD  
SOUTHERN SAN JOAQUIN VALLEY - 1998

Labor Rate: \$11.73/hr. machine labor  
\$7.71/hr. non-machine labor

Trees Per Acre: 48  
Long Term Interest Rate: 7.81%

Year	Cost Per Acre						
	1st	2nd	3rd	4th	5th	6th	7th
Yield: Field Run - Pounds Per Acre				80	300	600	800
<b>Planting Costs:</b>							
Land Preparation - Subsoil (Rip or Slip Plow)	\$250						
Land Preparation - Disc	7						
Land Preparation - Level	11						
Weed Control - Residual Herbicide	7						
Land Preparation - Incorporate Herbicide w/Disc	5						
Trees: 48 per Acre@ \$12.00 Each, (0.5 in 2nd year)	576	\$8					
Survey, Mark, Dig Holes & Plant	84						
Paint Tree Trunks	20	4					
<b>TOTAL PLANTING COSTS</b>	<b>960</b>	<b>12</b>					
<b>Cultural Costs:</b>							
Pruning	8	12	\$12	\$43	\$85	\$85	\$85
Brush Disposal				13	18	18	18
Fertilizer & Application - Nitrogen	2	8	16	20	51	51	51
Fertilizer & Application - Zinc & Urea LB - 4X	65	65	80	141	141	141	141
Weed Control - Spot Spray - 3X	21	21	21	21	21	21	21
Weed Control - Winter Residual		55	55	55	55	55	55
Insect Control - Black Aphid				25	25	25	25
Tillage - 4X	27	27					
Mow - 4X			61	61	61	61	61
Furrow Out - 3X	20	20					
Irrigate - 10X	86	86	174	200	200	200	200
Put Up Borders		7					
Leaf Analysis				1	1	1	1
Consultant Services				15	15	15	15
Management Services				1	1	1	1
Pickup Truck Use	49	49	49	49	49	49	49
ATV Use	41	41	41	41	41	41	41
<b>TOTAL CULTURAL COSTS</b>	<b>319</b>	<b>391</b>	<b>509</b>	<b>686</b>	<b>764</b>	<b>764</b>	<b>764</b>
<b>Harvest Costs:</b>							
Hand Pick				44			
Shake, Pick & Haul (1st pick)					150	150	185
Shake, Pick & Haul (2nd pick)							125
Hull, Dry, & Deliver				3	13	26	34
<b>TOTAL HARVEST COSTS</b>				<b>47</b>	<b>163</b>	<b>176</b>	<b>344</b>

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Table 1. Continued

Year	Cost Per Acre						
	1st	2nd	3rd	4th	5th	6th	7th
Yield: Field Run - Pounds Per Acre				80	300	600	800
<b>Cash Overhead Costs:</b>							
Office Expense	98	98	98	98	98	98	98
Sanitation Fees	5	5	5	5	5	5	5
Liability Insurance	8	8	8	8	8	8	8
Property Taxes	67	66	66	67	67	67	67
Property Insurance	48	47	47	47	47	47	47
Investment Repairs	22	22	22	22	22	22	22
<b>TOTAL CASH OVERHEAD COSTS</b>	<b>248</b>	<b>246</b>	<b>246</b>	<b>247</b>	<b>247</b>	<b>247</b>	<b>247</b>
<b>TOTAL CASH COSTS/ACRE</b>	<b>1,646</b>	<b>683</b>	<b>792</b>	<b>1,029</b>	<b>1,229</b>	<b>1,242</b>	<b>1,414</b>
<b>INCOME/ACRE FROM PRODUCTION</b>				88	330	660	880
<b>NET CASH COSTS/ACRE FOR THE YEAR</b>	<b>1,646</b>	<b>683</b>	<b>792</b>	<b>941</b>	<b>899</b>	<b>582</b>	<b>534</b>
<b>ACCUMULATED NET CASH COSTS/ACRE</b>	<b>1,646</b>	<b>2,329</b>	<b>3,121</b>	<b>4,062</b>	<b>4,961</b>	<b>5,543</b>	<b>6,077</b>
<b>Capital Recovery Costs:</b>							
Land @ \$5,455/Producing Acre	426	426	426	426	426	426	426
Shop Building	72	72	72	72	72	72	72
Flood Irrigation System	41	41	41	41	41	41	41
Shop Tools	23	23	23	23	23	23	23
Pruning Tools	2	2	2	2	2	2	2
Equipment	122	101	98	108	108	108	108
<b>TOTAL CAPITAL RECOVERY COST/ACRE</b>	<b>686</b>	<b>665</b>	<b>662</b>	<b>672</b>	<b>672</b>	<b>672</b>	<b>672</b>
<b>TOTAL COST/ACRE FOR THE YEAR</b>	<b>2,332</b>	<b>1,348</b>	<b>1,454</b>	<b>1,701</b>	<b>1,901</b>	<b>1,914</b>	<b>2,086</b>
<b>INCOME/ACRE FROM PRODUCTION</b>				88	330	660	880
<b>TOTAL NET COST/ACRE FOR THE YEAR</b>	<b>2,332</b>	<b>1,348</b>	<b>1,454</b>	<b>1,613</b>	<b>1,571</b>	<b>1,254</b>	<b>1,206</b>
<b>NET PROFIT/ACRE ABOVE TOTAL COST</b>							
<b>TOTAL ACCUMULATED NET COST/ACRE</b>	<b>2,332</b>	<b>3,680</b>	<b>5,134</b>	<b>6,747</b>	<b>8,318</b>	<b>9,572</b>	<b>10,778</b>



U.C. COOPERATIVE EXTENSION

Table 2. Continued

CAPITAL RECOVERY: Investment	Per producing Acre	-- Annual Cost -- Capital Recovery - 7.81% Interest	
-----	-----	-----	-----
Land	5455	426	426
Buildings	714	72	72
Irrigation System	500	41	41
Shop Tools	206	23	23
Pecan Orchard Establishment	4062	338	338
Pruning Tools	5	2	2
Thinning - Tree Removal	175	15	15
Equipment	826	108	108
TOTAL CAPITAL RECOVERY COSTS	11942	1025	1025
-----			-----
TOTAL COSTS/ACRE			2484
=====			=====

Table 3.

U.C. COOPERATIVE EXTENSION					
COSTS AND RETURNS PER ACRE TO PRODUCE PECANS					
SOUTHERN SAN JOAQUIN VALLEY - 1998					
	Quantity/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Pecans	1700.00	Lb	1.10	1870	
				-----	
TOTAL GROSS RETURNS FOR PECANS					1870
-----					
OPERATING COSTS					
Custom:					
Prune - Mechanical	1.00	Acre	85.00	85	
Ground Application	5.00	Acre	20.00	100	
Herbicide:					
Roundup Ultra	0.75	Pint	7.84	6	
Goal 2 XL	2.00	Pint	14.48	29	
Surflan 4 AS	2.00	Pint	10.46	21	
Irrigation:					
Water	56.00	AcIn	3.15	176	
Fertilizer:					
UN-32	150.00	Lb N	0.393	59	
Urea LB	24.00	Lb	0.74	18	
Zinc Sulfate 36%	48.00	Lb	0.36	17	
Rent:					
Fertilizer Applicator	1.00	Acre	5.50	6	
Acaracide:					
Cygon 400	1.00	Pint	5.33	5	
Harvest:					
1st Pick	1.00	Acre	185.00	185	
2nd Pick	1.00	Acre	125.00	125	
Hull Dry & Deliver	0.85	Ton	85.00	72	
Contract:					
Leaf Analysis	1.00	Acre	1.00	1	
PCA Fees	1.00	Acre	15.00	15	
Management Fee	1.00	Acre	1.00	1	
Labor (machine)	11.57	Hrs	11.73	136	
Labor (non-machine)	4.00	Hrs	7.71	31	
Fuel - Gas	8.99	Gal	1.22	11	
Fuel - Diesel	19.42	Gal	0.78	15	
Lube				4	
Machinery repair				22	
Interest on operating capital @ 10.46%				<u>36</u>	
TOTAL OPERATING COSTS/ACRE					1176
-----					
NET RETURNS ABOVE OPERATING COSTS					694
-----					

U.C. COOPERATIVE EXTENSION

Table 3. Continued

	Quantity/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
CASH OVERHEAD COSTS:					
Office Expense				98	
Liability Insurance				8	
Sanitation Fees				5	
Property Taxes				88	
Property Insurance				63	
Investment Repairs				22	
				-----	
TOTAL CASH OVERHEAD COSTS/ACRE				283	
				-----	
TOTAL CASH COSTS/ACRE				1459	
				-----	
CAPITAL RECOVERY: 7.81% Interest					
Land				426	
Buildings				72	
Irrigation System				41	
Shop Tools				23	
Pecan Orchard Establishment				338	
Pruning Tools				2	
Thinning - Tree Removal				15	
Equipment				108	
				-----	
TOTAL CAPITAL RECOVERY COSTS/ACRE				1025	
				-----	
TOTAL COSTS/ACRE				2484	
				-----	
NET RETURNS ABOVE TOTAL COSTS				-614	
				=====	

U.C. COOPERATIVE EXTENSION  
MONTHLY CASH COSTS PER ACRE TO PRODUCE PECANS  
SOUTHERN SAN JOAQUIN VALLEY - 1998

Table 4

Beginning FEB 98	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	TOTAL
Ending JAN 99	98	98	98	98	98	98	98	98	98	98	98	99	
<b>Cultural:</b>													
Pruning	85												85
Brush Disposal	18												18
Weed Control - Spot Spray 3X			7	7		7							21
Weed Control - Mow Middle 4X			15	15		15		15					61
Irrigate 10X			21	39	39	39	39	21					200
Fertilizer - Nitrogen				71									71
Fertilizer - Foliar N & Zn 4X				29	29	29	29						115
Insect Control - Black Aphid								25					25
Weed Control - Winter Residual										55			55
Leaf Analysis						1							1
Consultant Services	1	1	1	1	1	1	1	1	1	1	1	1	15
Management Services	0	0	0	0	0	0	0	0	0	0	0	0	1
Pickup Truck Use	4	4	4	4	4	4	4	4	4	4	4	4	48
ATV Use	3	3	3	3	3	3	3	3	3	3	3	3	41
<b>TOTAL CULTURAL COSTS</b>	<b>112</b>	<b>9</b>	<b>53</b>	<b>170</b>	<b>77</b>	<b>100</b>	<b>77</b>	<b>71</b>	<b>9</b>	<b>64</b>	<b>9</b>	<b>9</b>	<b>757</b>
<b>Harvest:</b>													
Shake, Pick & Haul								185					185
- 1st Pick										125			125
- 2nd Pick									37	36			72
Hull Dry & Deliver													
<b>TOTAL HARVEST COSTS</b>								<b>222</b>	<b>161</b>				<b>382</b>
Interest on oper. Capital*	1	1	2	3	4	5	5	8	9	-1	-0	-0	36
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>113</b>	<b>10</b>	<b>54</b>	<b>173</b>	<b>80</b>	<b>105</b>	<b>82</b>	<b>300</b>	<b>179</b>	<b>63</b>	<b>9</b>	<b>9</b>	<b>1176</b>
<b>OVERHEAD:</b>													
Office Expense	8	8	8	8	8	8	8	8	8	8	8	8	98
Liability Insurance	8												8
Sanitation Fees	0	0	0	0	0	0	0	0	0	0			5
Property Taxes						44						44	88
Property Insurance						31						31	63
Investment Repairs	2	2	2	2	2	2	2	2	2	2	2	2	22
<b>TOTAL CASH OVERHEAD COSTS</b>	<b>18</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>86</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>85</b>	<b>283</b>
<b>TOTAL CASH COSTS/ACRE</b>	<b>131</b>	<b>20</b>	<b>65</b>	<b>184</b>	<b>91</b>	<b>190</b>	<b>92</b>	<b>311</b>	<b>189</b>	<b>74</b>	<b>19</b>	<b>94</b>	<b>1459</b>

\* Postharvest operation costs are discounted back to the time of the first harvest



Table 5.

U.C. COOPERATIVE EXTENSION  
 WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS  
 SOUTHERN SAN JOAQUIN VALLEY - 1998

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	- Cash Overhead -		Total
						Insur- ance	Taxes	
98	80 HP 2WD Tractor	35500	15	6911	3841	151	212	4204
98	ATV 4WD	4219	7	1600	625	21	29	675
98	Brush Rake - 10'	1584	25	45	145	6	8	159
98	Front End Loader	4852	15	466	543	19	27	588
98	Mower - Flail 10'	8380	10	1482	1135	35	49	1219
98	Pickup Truck - 1/2 Ton	17240	7	1724	3095	68	95	3258
98	Weed Sprayer - 100 Gal	3947	10	698	535	17	23	574
TOTAL		75722		12926	9919	316	443	10678
60% of New Cost *		45433		7756	5951	190	266	6407

\* 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	39253	20		3942	140	196	785	5063
Irrigation System	27500	40		2259	98	138	270	2765
Land	300000	40	300000	23430	2139	3000	0	28569
Pecan Orchard Establishment	223410	37		18599	796	1117	0	20513
Pruning Tools	250	3	20	91	1	1	50	143
Shop Tools	11330	15	1133	1266	44	62	113	1486
Tree Thinning	9635	31		833	34	48	0	916
TOTAL INVESTMENT	611378		301153	50420	3253	4563	1218	59454

U.C. COOPERATIVE EXTENSION

Table 5. Continued

ANNUAL BUSINESS OVERHEAD COSTS

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Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	60.00	Acre	7.58	455
Office Expense	60.00	Acre	90.00	5400
Sanitation Fees	60.00	Acre	4.27	256

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U.C. COOPERATIVE EXTENSION  
HOURLY EQUIPMENT COSTS  
SOUTHERN SAN JOAQUIN VALLEY - 1998

Table 6.

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Yr Description	Actual Hours Used	----- COSTS PER HOUR -----					Operating Fuel & Lube	Total Oper.	Total Costs/Hr.
		Capital Recovery	- Cash Insur- ance	Overhead Taxes	Repairs				
98 80 HP 2WD Tractor	272.3	8.46	0.33	0.47	1.46	3.52	4.98	14.25	
98 ATV 4WD	142.0	2.64	0.09	0.12	0.31	1.40	1.71	4.56	
98 Brush Rake - 10'	27.5	3.17	0.13	0.18	0.21	0.00	0.21	3.69	
98 Front End Loader	27.5	11.84	0.41	0.58	0.67	0.00	0.67	13.51	
98 Mower - Flail 10'	146.7	4.64	0.14	0.20	3.40	0.00	3.40	8.38	
98 Pickup Truck - 1/2 Ton	142.0	13.08	0.29	0.40	1.25	3.51	4.76	18.53	
98 Weed Sprayer - 100 Gal	55.0	5.83	0.18	0.25	1.04	0.00	1.04	7.31	

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Table 7.

U.C. COOPERATIVE EXTENSION  
RANGING ANALYSIS  
SOUTHERN SAN JOAQUIN VALLEY - 1998

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE PECANS

	YIELD (LB/ACRE)						
	1100	1300	1500	1700	1900	2100	2300
OPERATING COSTS/ACRE:							
Cultural Cost	757	757	757	757	757	757	757
Harvest Cost	357	365	374	382	391	399	408
Interest on operating capital	36	36	36	36	36	36	36
TOTAL OPERATING COSTS/ACRE	1150	1158	1167	1176	1184	1193	1201
TOTAL OPERATING COSTS/LB	1.05	0.89	0.78	0.69	0.62	0.57	0.52
CASH OVERHEAD COSTS/ACRE							
	283	283	283	283	283	283	283
TOTAL CASH COSTS/ACRE	1433	1441	1450	1459	1467	1476	1484
TOTAL CASH COSTS/LB	1.30	1.11	0.97	0.86	0.77	0.70	0.65
CAPITAL RECOVERY COSTS/ACRE							
	1025	1025	1025	1025	1025	1025	1025
TOTAL COSTS/ACRE	2458	2466	2475	2484	2492	2501	2509
TOTAL COSTS/LB	2.23	1.90	1.65	1.46	1.31	1.19	1.09

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR PECANS

PRICE (DOLLARS/LB)	YIELD (LB/ACRE)						
	1100	1300	1500	1700	1900	2100	2300
Pecans							
0.80	-270	-118	33	184	336	487	639
0.90	-160	12	183	354	526	697	869
1.00	-50	142	333	524	716	907	1099
1.10	60	272	483	694	906	1117	1329
1.20	170	402	633	864	1096	1327	1559
1.30	280	532	783	1034	1286	1537	1789
1.40	390	662	933	1204	1476	1747	2019

U.C. COOPERATIVE EXTENSION

Table 7. Continued

NET RETURNS PER ACRE ABOVE CASH COSTS FOR PECANS

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PRICE (DOLLARS/LB)	YIELD (LB/ACRE)						
Pecans	1100	1300	1500	1700	1900	2100	2300
0.80	-553	-401	-250	-99	53	204	356
0.90	-443	-271	-100	71	243	414	586
1.00	-333	-141	50	241	433	624	816
1.10	-223	-11	200	411	623	834	1046
1.20	-113	119	350	581	813	1044	1276
1.30	-3	249	500	751	1003	1254	1506
1.40	107	379	650	921	1193	1464	1736

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NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR PECANS

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PRICE (DOLLARS/LB)	YIELD (LB/ACRE)						
Pecans	1100	1300	1500	1700	1900	2100	2300
0.80	-1578	-1426	-1275	-1124	-972	-821	-669
0.90	-1468	-1296	-1125	-954	-782	-611	-439
1.00	-1358	-1166	-975	-784	-592	-401	-209
1.10	-1248	-1036	-825	-614	-402	-191	21
1.20	-1138	-906	-675	-444	-212	19	251
1.30	-1028	-776	-525	-274	-22	229	481
1.40	-918	-646	-375	-104	168	439	711

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Table 8.

U.C. COOPERATIVE EXTENSION  
 COSTS AND RETURNS / BREAKEVEN ANALYSIS  
 SOUTHERN SAN JOAQUIN VALLEY - 1998

COSTS AND RETURNS - PER ACRE BASIS

Crop	1. Gross Returns	2. Operating Costs	3. Net Returns Above Oper. Costs (1-2)	4. Cash Costs	5. Net Returns Above Cash Costs (1-4)	6. Total Costs	7. Net Returns Above Total Costs (1-6)
Pecans	1870	1176	694	1459	411	2484	-614

COSTS AND RETURNS - TOTAL ACREAGE

Crop	1. Gross Returns	2. Operating Costs	3. Net Returns Above Oper. Costs (1-2)	4. Cash Costs	5. Net Returns Above Cash Costs (1-4)	6. Total Costs	7. Net Returns Above Total Costs (1-6)
Pecans	102850	64659	38191	80221	22629	136593	-33743

BREAKEVEN PRICES PER YIELD UNIT

CROP	Base Yield (Units/Acre)	Yield Units	Breakeven Price To Cover		
			Operating Costs	Cash Costs	Total Costs
Pecans	1700.0	Lb	0.69	0.86	1.46

BREAKEVEN YIELDS PER ACRE

CROP	Yield Units	Base Price (\$/Unit)	Breakeven Yield To Cover		
			Operating Costs	Cash Costs	Total Costs
Pecans	Lb	1.10	1068.7	1326.0	2257.7