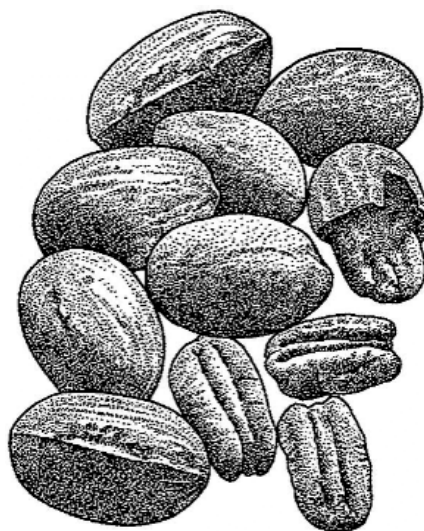

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2005

**SAMPLE COSTS TO
ESTABLISH AND PRODUCE
PECANS**



**SAN JOAQUIN VALLEY and
SACRAMENTO VALLEY**
Flood Irrigated

Mark W. Freeman
G. Steven Sibbett
Karen M. Klonsky

UC Cooperative Extension Farm Advisor, Fresno County
UC Cooperative Extension Farm Advisor Emeritus, Tulare County
UC Cooperative Extension Economist, Department of Agricultural and Resource
Economics, UC Davis

Richard L. De Moura

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

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION
2005
SAMPLE COSTS TO ESTABLISH AND PRODUCE PECANS
San Joaquin Valley and Sacramento Valley
Flood Irrigated

STUDY CONTENTS

ASSUMPTIONS	3
Establishment Operating Costs	3
Production Operating Costs	5
Cash Overhead	7
Non-Cash Overhead.....	8
REFERENCES.....	10
Table 1. Costs Per Acre to Establish A Pecan Orchard.....	11
Table 2. Materials and Custom Work Costs Per Acre – Establishment Years	12
Table 3. Costs per acre to Produce Pecans.....	13
Table 4. Costs and Returns Per Acre to Produce Pecans.....	14
Table 5. Monthly Cash Cost Per Acre to Produce Pecans.....	15
Table 6. Ranging Analysis.....	16
Table 7. Whole Farm Annual Equipment, Investment, Business Overhead Costs.....	17
Table 8. Hourly Equipment Costs	18
Table 9. Operations With Equipment.....	18

University of California and the United States Department of Agriculture, Risk Management Agency, Cooperating

INTRODUCTION

Sample costs to establish a pecan orchard and produce pecans in the San Joaquin and the Sacramento Valley are presented in this study. This study is intended as a guide only, and can be used to make production decisions, determine potential returns, prepare budgets and evaluate production loans. The production practices described in this study are those considered typical for growing pecans in the San Joaquin and the Sacramento Valley, but they will not apply to every situation. Sample costs for labor, materials, equipment and custom services are based on current figures. A blank column, “Your Costs”, in Tables 3 and 4 is provided to enter your farm costs.

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

Sample Cost of Production Studies for many commodities can be downloaded at <http://coststudies.ucdavis.edu>, requested through the Department of Agricultural and Resource Economics, UC Davis, (530) 752-4424 or obtained from the local county UC Cooperative Extension offices. Some archived studies are also available on the website.

The University of California does not discriminate in any of its policies, procedures or practices. The university is an affirmative action/equal opportunity employer.

ASSUMPTIONS

The assumptions refer to Tables 1 to 9 and pertain to sample costs to establish an orchard and produce pecans in the San Joaquin Valley and the Sacramento Valley under flood irrigation. The cultural practices described and materials used are considered typical for a well-managed orchard in the regions. The costs, materials, and practices will not apply to all situations. Establishment and production practices vary by grower and the differences can be significant. **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.**

Land. This report is based on a 60-acre farm of which 58 acres are planted to pecans. Roads, irrigation systems and farmstead occupy the remaining two acres. The owner farms the orchard.

Orchard Establishment Operating Costs

This orchard is established on ground that has been previously planted to other tree, 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. Custom operators begin land preparation by slip plowing the soil profile five to six feet deep in the tree row and subsoiling the middles to break up any underlying hardpan or mix stratified soils that would affect root penetration and water infiltration. Following ripping and slip plowing, the ground is disked twice; then leveled with a triplane to allow for efficient irrigation. The grower sprays the tree rows (20% of the acres) with an herbicide and then incorporates it by disking one time. 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. The topography of the land may dictate whether one levels the land and uses surface irrigation or not level and use drip or sprinkler irrigation. If leveling costs will be excessive (exceeding \$500 per acre), one should consider not leveling and using pressurized irrigation systems

Trees. No specific pecan varieties are planted in this study. Cultivars that represent the majority of recent pecan acreage in California are: Wichita, Shoshone, Western Schley, and Pawnee. Most orchards include Wichita or Pawnee as the main variety (75% - 80%) with one or two of the remaining three varieties included where pollen shedding and bloom periods coincide to ensure adequate pollination. The trees for this study are planted on a 30-foot X 30-foot spacing, 48 trees per acre. Some new orchards are planted on a 35-foot X 35-foot spacing. 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.

Plant/Prune. Planting the orchard starts by marking tree sites, digging holes, planting and watering in the trees. Later, trunks are treated with white, water-based paint to protect them from sunburn. New trees are topped soon after planting and one shoot trained up to be the trunk. Regular pruning begins in the second year. Trees are pruned to a modified central leader shape (similar to walnuts) and most limb selection is done during the third and fourth years. Hand pruning continues through the fifth year, after which mechanical pruning (hedging and topping) is the typical practice. Pruning is done in the winter months (February). In the second year, 2% of the trees or one tree per acre is replaced due to tree death or poor growth.

Irrigation. Water costs include water at \$4.00 per acre-inch (\$48 per acre-foot) and irrigation labor at 0.15 hours per irrigation. Price per acre-foot for water will vary depending on the irrigation district, and/or various well characteristics, and other irrigation factors. The amount of water applied to the orchard during the establishment period varies each year and is shown in Table A. 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. If leveling costs will be excessive, pressurized irrigation systems should be considered which do not require leveling. In northern California, most of the pecans are irrigated using a pressurized irrigation system.

Year	Acre-inches per Year
1	20
2	20
3	48
4+	56

Fertilization. Nitrogen is the major nutrient required for proper tree growth and optimum yields. Nitrogen fertilizer is usually applied in a liquid form such as 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. It is applied twice - April and August. Annual rates of actual N are shown in Table B. Zinc is supplied to the trees with four regularly applied foliar sprays as zinc deficiency readily occurs in pecan trees if not supplemented. Zinc sulfate is mixed with a low biuret (L.B.) urea or potassium nitrate to enhance uptake of the foliar zinc spray. Because of tree size, the amount of material applied will increase as the trees grow. The trees may also benefit from the additional nitrogen in the urea or potassium nitrate. Ground fertilization with zinc is not effective in soils typical of those where pecans are grown in California.

Year	Pounds of N/Acre	Gallons of UN32/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+	200	56.4

Pest Management. The pesticides and rates mentioned in this cost study as well as other materials available are listed in *UC Integrated Pest Management Guidelines, Pecans* available online at www.imp.ucdavis.edu. Pesticides mentioned in the study are commonly used, but are not recommendations.

Weeds. Prior to planting, trifluralin (Treflan) herbicide is applied to the marked tree rows and incorporated by disking. Chemical weed control in the planted orchard begins in the spring of the first year using a contact herbicide, glyphosate (Roundup), to manage emerged weeds as a 'spot spray' where needed. For this study it is assumed that 10% of the orchard is sprayed, although the applicator will drive the ATV and sprayer through the entire orchard. In the second fall residual herbicides such as – oxyflourfen (Goal) and oryzalin (Surflan) - are sprayed in the tree rows (20% of the orchard). The row middles are disked during the first two years, and in the third year and subsequent years, they are mowed.

Insects. During the establishment years, pest control is minimal and in this study, begins in the fourth year. Yellow and black aphids are the only economic insect pests of pecans in California. Several insecticides are available for aphid control. Imidocloprid (Admire) insecticide may be applied through a drip system, whereas Aldicarb (Temik), a systemic insecticide, is shanked along the drip line in May by a custom applicator. Dimethoate or other foliar insecticide is applied in spring or fall as needed (September in this study).

Disease. There are no known economic disease or nematode problems with pecans in California.

Harvest. Harvest starts in the fourth year after the orchard is planted. In the first harvest year the pecans 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.

Table C. Annual yield per acre	
Year	Dry, inshell lbs/acre
4	80
5	300
6	600
7	800
8	1,500
9+	2,000

Yields and Returns. Although pecans most often begin bearing an economic crop in the fourth year after planting, yield maturity is not reached until the ninth or tenth year. Typical annual yields for the common varieties are measured in clean, dry, inshell pounds per acre and are shown in Table C.

Production Cultural Operating Costs – Mature Trees

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 University of California Cooperative Extension farm advisor in the county of interest.

Pruning. In this study, pruning is done during the winter months (January-February) with the use of mechanical hedgers, but mechanical towers for hand pruning are also commonly used. Beginning in the sixth year, one-half of the trees are hedged and topped each year, usually every other middle, resulting in a hedging and topping cut to one side of every tree adjoining that middle. Prunings are placed in the alternate row middles and shredded.

Nut Thinning. Nut thinning by mechanical shaking is done as needed on over-loaded trees in July. Nut thinning improves nut quality (size and kernel fill) and mitigates alternate bearing. For this study, one third of the trees require thinning each year.

Fertilization. Nitrogen such as UN-32 (liquid fertilizer) is applied to the soil surface prior to an irrigation at a rate of 100 pounds of N per acre in April and again in August. Zinc is applied as a foliar spray four times from May through July every 2-4 weeks. Zinc sulfate is mixed with low biuret urea (L.B.) or potassium nitrate each time to enhance zinc uptake. Low biuret urea is applied in this study and also adds a small amount of foliar nitrogen to the trees.

Leaf Sampling. Leaf - tissue samples - sampling for nutritional analyses are taken in July. It is assumed the cost will include an individual who will collect one sample per 20 acres and take approximately 3 1/2 hours to collect, package, and mail the samples. The cost includes the lab fees.

Pest Management. The pesticides and rates mentioned in this cost study are listed in *UC Integrated Pest Management Guidelines, Pecans*. For more information on other pesticides available, pest identification, monitoring, and management visit the above UC IPM website at www.ipm.ucdavis.edu. For information and pesticide use permits, contact the local county agricultural commissioner's office. Adjuvants are recommended for many pesticides for effective control and are an added cost. The adjuvants in this study are not included as a cost in the applications. Pesticide costs may vary by location and grower volume. **Pesticide costs** in this study are taken from a single dealer and **shown as full retail**.

Pest Control Adviser (PCA). Licensed pest control advisers provide the written recommendations required for many pesticides. In addition, the PCA monitors the orchard for pest, disease, and nutritional problems. Growers may hire a private PCA or receive the service as part of an agreement with an agricultural chemical and fertilizer company. In this study, the grower contracts with a private PCA or consultant.

Weed. Annual weeds are controlled in the tree row (20% of the acres) during the fall by a strip spray of a residual pre-emergence herbicide – oxyflourfen (Goal) and oryzalin (Surflan) combination. Weeds are controlled in the tree row during the season with three – April, May, July - ‘spot sprays’ using glyphosate (Roundup), a contact herbicide.

Insects. Yellow and black aphids are the only economic insect pests of pecans in California. Both aphids are controlled with a systemic insecticide imidocloprid or aldicarb (Admire or Temik) and a foliar application of dimethoate each year. Aldicarb (Temik) is shanked into the soil along the tree dripline by a custom applicator in May. For growers using drip systems, the imidocloprid (Admire) is applied through the drip line. Dimethoate is applied with an orchard sprayer in spring or fall as needed (September in this study).

Harvest. 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. Pecans are shaken and picked up the same day, similar to walnuts. Mechanical harvesting begins by shaking the tree trunk to drop the nuts. The sweeper windrows the pecans into the orchard row middles where they are picked up by a mechanical harvester and dumped into field trailers. The pecans are hauled from the field to a “cleaner” and huller to remove hulls and foreign material. They are then conveyed to the dehydrator for drying. After drying, the pecans are sold to processors. In this cost study, the crop is harvested and hauled by a custom harvesting company. All costs for custom harvest operations are charged on per acre basis. The nuts are hulled and dried at a commercial plant. The grower pays drying costs.

Yields and Returns. Typical annual yields for the more common varieties are measured in clean, dry, inshell pounds per acre and are shown in Table D. Once mature, pecans show a tendency for alternate bearing; i.e. a heavy crop followed by a more modest crops. Over the remaining life of the orchard, the average yield is expected to be 2,000 pounds per acre per year. Based on the current market an estimated return of \$1.20 per pound is used in this study to determine potential profits/losses.

Pickup/ATV. The study assumes business use mileage of 4,640 miles per year for the pickup. The ATV is used for spot spraying and is included in those specific costs. Use of the ATV for monitoring the orchard and checking the irrigation is shown under the ATV operation and assumes a use of 3-hours per acre.

Labor. Labor rates of \$13.80 per hour for machine operators and \$9.32 for general labor includes payroll overhead of 38%. The basic hourly wages are \$10.00 for machine operators and \$6.75 for general labor. The overhead includes the employers’ share of federal and California state payroll taxes, workers’ compensation insurance for nut orchards (code 0045), and a percentage for other possible benefits. Workers’ compensation insurance costs will vary among growers, but for this study the cost is based upon the average industry final rate as of January 1, 2005 (California Department of Insurance). Labor for operations involving machinery are 20% higher than the operation time given in Table 1 to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and field repair.

Wages for management are not included as a cash cost. Any return above total costs is considered a return to management and risk. However, growers wanting to account for management may wish to add a fee. The manager makes all production decisions including cultural practices, action to be taken on pest management recommendations, and labor.

Equipment Operating Costs. Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by American Society of Agricultural Engineers (ASAE). Fuel and lubrication costs are also determined by ASAE equations based on maximum Power Take Off (PTO)

horsepower, and fuel type. Prices for on-farm delivery of diesel and gasoline are \$1.51 and \$2.05 per gallon, respectively. The cost includes a 2% local sales tax on diesel fuel and 8% sales tax on gasoline. Gasoline also includes federal and state excise tax, which are refundable for on-farm use when filing your income tax. The fuel, lube, and repair cost per acre for each operation in Table 1 is determined by multiplying the total hourly operating cost in Table 6 for each piece of equipment used for the selected operation by the hours per acre. Tractor time is 10% higher than implement time for a given operation to account for setup, travel and down time.

Interest On Operating Capital. Interest on operating capital is based on cash operating costs and is calculated monthly until harvest at a nominal rate of 7.65% 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. Production risks 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.

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, equipment repairs, and management.

Property Taxes. Counties charge a base property tax rate of 1% on the assessed value of the property. In some counties special assessment districts exist and charge additional taxes on property including equipment, buildings, and improvements. For this study, county taxes are calculated as 1% of the average value of the property. Average value equals new cost plus salvage value divided by 2 on a per acre basis.

Insurance. Insurance for farm investments varies depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.69% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$529 for the 60 acre farm or \$8.82 per acre

Office Expense. Office and business expenses are estimated at \$105 per producing acre (58 acres). These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, shop and office utilities, and miscellaneous administrative charges. The cost is a general estimate and not based on any actual data.

Sanitation Services. Sanitation services provide double portable toilets, washbasins, soap, and towels for the orchard and cost the farm \$235 per month or \$8.10 per producing acre. The monthly service charge is an average of four to six California sanitation companies and locations. The cost includes delivery and two months of weekly service. The sanitation costs are estimated and not based on any specific grower data. Growers using contract labor may not have a cost, because many labor contractors provide their own sanitation facilities.

Management/Supervisor Salaries. The grower farms the orchard; therefore no salaries are included for management. Returns above costs are considered a return to management.

Investment Repairs. Annual maintenance is calculated as two 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. The purchase price and salvage value for equipment and investments are shown in the tables.

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 6.01% used to calculate capital recovery cost is the USDA-ERS's ten-year average of California's agricultural sector long-run rate of return to production assets from current income. It is used to reflect the long-term realized rate of return to these specialized resources that can only be used effectively in the agricultural sector.

Establishment Cost. Costs to establish the orchard are used to determine capital recovery expenses, depreciation, and interest on investment for the production years. Establishment cost is the sum of the costs for land preparation, planting, trees, cash overhead and production expenses for growing the trees through the first year that pecans are harvested minus any returns from production. In Table 1, the Total Accumulated Net Cash Cost in the sixth year represents the establishment cost. For this study the cost is \$4,287 per producing acre or \$248,646 for the 58-acre orchard. The establishment cost is spread over the remaining 36 producing years of the 40 years of orchard life.

Irrigation System. For this study, the orchard is irrigated using a flood irrigation system. Water is delivered to the orchard from the district ditch or deep well and distributed to the orchard by way of underground mainlines and valves. The life of the irrigation system is estimated at 40 years. Pressurized (micro-sprinkler) systems are also used in some orchards, but the initial capital costs are higher. 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 in the tables.

Land. The orchard is established on field or row crop land. Field or row cropland costs range from \$2,000 to \$5,000 per acre. Land in this study is valued at \$4,000 per acre or \$4,138 per producing acre. No value is established for land with producing pecan orchards.

Building. The buildings total 2,400 square feet and are metal building/buildings on a cement slab.

Tools. This includes shop tools, hand tools, and miscellaneous field tools such as pruning tools.

Fuel Tanks. Two 250-gallon fuel tanks using gravity feed are on metal stands. The tanks are setup in a cement containment pad that meets federal, state, and county regulations.

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 the Whole Farm Annual Equipment, Investment, and Business Overhead Costs table. 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.

REFERENCES

- American Society of Agricultural Engineers. 1992. *American Society of Agricultural Engineers Standards Yearbook*. St. Joseph, MI.
- American Society of Farm Managers and Rural Appraisers. 2004. *Trends in Agricultural Land & Lease Values*. California Chapter of the American Society of Farms Managers and Rural Appraisers. Woodbridge, CA.
- Barker, Doug. 2005. *California Workers' Compensation Rating Data for Selected Agricultural Classifications as of January 1, 2005*. California Department of Insurance, Rate Regulation Branch.
- Boehlje, Michael D., and Vernon R. Eidman. 1984. *Farm Management*. John Wiley and Sons. New York, NY
- California State Automobile Association. 2005. *Gas Price Survey 2004*. AAA Public Affairs, San Francisco, CA.
- California State Board of Equalization. *Fuel Tax Division Tax Rates*.
<http://www.boe.ca.gov/sptaxprog/spftdrates.htm>. Internet accessed January 2005.
- Doanes. 1984. *Facts and Figures for Farmers*. 1984. Doane Publishing, St. Louis, MO.
- Energy Information Administration. 2004. *Weekly Retail on Highway Diesel Prices*.
<http://tonto.eis.doe.gov/oog/info/wohdp>. Internet accessed January 2005.
- Fulton, Allan, and Blake Sanden. 2001. *Site Evaluation and Soil Physical Modification*. Reprint provided by Blake Sanden UCCE Farm Advisor, Kern County.
- Sibbett, G. Steven, Karen M. Klonsky, and Pete Livingston. 1998. *Sample Cost to Establish a Pecan Orchard and Produce Pecans, Southern San Joaquin Valley – 1998*. UC Cooperative Extension, University of California, Department of Agricultural and Resource Economics, Davis, CA.
- University of California Statewide IPM Project. 2000. *UC Pest Management Guidelines, Pecans*. University of California, Davis CA. <http://www.ipm.ucdavis.edu> Internet accessed; June 12, 2004.
- United States Department of Agriculture-Economic Reporting Service. *Farm Financial Ratios Indicating Solvency and Profitability 1960 – 02, California*. 2002.
www.ers.usda.gov/data/farbalancesheet/fbsdmu.htm Internet; accessed January 4, 2005.

UC COOPERATIVE EXTENSION

Table 1. SAMPLE COSTS PER ACRE TO ESTABLISH A PECAN ORCHARD
SAN JOAQUIN VALLEY and SACRAMENTO VALLEY 2005

	Cost Per Acre					
	Year:	1st	2nd	3rd	4th	5th
Yield: Field Run - Pounds Per Acre:					80	300
Planting Costs:						
Land Prep: Slip Plow Tree Row/Subsoil Middles		390				
Land Prep: Disk 2X		40				
Land Prep: Laser Level		150				
Weed: Residual Herbicide (Treflan)		6				
Land Prep: Incorporate Herbicide w/Disk		5				
Trees: 48 Per Acre (replant 1in 2nd year) - Custom		624	13			
Survey, Mark, Dig Holes, Plant, Water. - Custom		96	2			
Paint Tree Trunks		24	2			
TOTAL PLANTING COSTS		1,335	17			
Cultural Costs:						
Prune: Hand		9	14	19	23	44
Prune: Shred Prunings					10	10
Fertilizer: Nitrogen		2	8	12	20	70
Fertilizer: Foliar 4X (Zinc & Urea LB)		46	46	52	67	67
Weed: Spot Spray Tree Row 3X (Roundup)		18	18	18	18	18
Weed: Tree Row (Surflan, Goal)			66	66	66	66
Insect: Aphid (Dimethoate) (Temik)					138	138
Weed: Disk Centers 4X		19	19			
Weed: Mow Centers 4X				42	42	42
Irrigate: Furrow Out 3X		7	7			
Irrigate: 10X		94	94	206	238	238
Put Up Borders			9			
Fertilize: Leaf Analysis					2	2
PCA: Consultant Services					20	20
Pickup Truck Use		51	51	51	51	51
ATV Use		54	54	54	54	54
TOTAL CULTURAL COSTS		300	386	520	749	820
Harvest Costs:						
Hand Pick					56	
Shake, Pick & Haul						150
Hull, Dry, & Deliver					5	20
TOTAL HARVEST COSTS					61	170
Interest On Operating Capital @ 7.65%		107	10	13	21	25
TOTAL OPERATING COSTS/ACRE		1,742	413	533	831	1,015
Cash Overhead Costs:						
Office Expense		105	105	105	105	105
Sanitation Fees		8	8	8	8	8
Liability Insurance		9	9	9	9	9
Property Taxes		55	55	55	55	55
Property Insurance		10	10	10	10	10
Investment Repairs		29	29	29	29	29
TOTAL CASH OVERHEAD COSTS		216	216	216	216	216
TOTAL CASH COSTS/ACRE		1,958	629	749	1,047	1,231
INCOME/ACRE FROM PRODUCTION					96	360
NET CASH COSTS/ACRE FOR THE YEAR		1,958	629	749	951	871
ACCUMULATED NET CASH COSTS/ACRE		1,958	2,587	3,336	4,287	5,158

UC COOPERATIVE EXTENSION

Table 1. continued

	Cost Per Acre					
	Year:	1st	2nd	3rd	4th	5th
Yield: Field Run - Pounds Per Acre:						
					80	300
Non-Cash Overhead Costs (Capital Recovery):						
Land		249	249	249	249	249
Shop Building		68	68	68	68	68
Flood Irrigation System		30	30	30	30	30
Shop/Field Tools		21	21	21	21	21
Equipment		126	128	123	123	123
TOTAL NON-CASH OVERHEAD COST/ACRE		494	496	491	491	491
TOTAL COST/ACRE FOR THE YEAR		2,452	1,125	1,240	1,538	1,722
INCOME/ACRE FROM PRODUCTION						
TOTAL NET COST/ACRE FOR THE YEAR		2,452	1,125	1,240	1,538	1,722
NET PROFIT/ACRE ABOVE TOTAL COST						
TOTAL ACCUMULATED NET COST/ACRE		2,452	3,577	4,817	6,355	8,077

UC COOPERATIVE EXTENSION

Table 2. MATERIALS AND CUSTOM WORK COSTS PER ACRE - ESTABLISHMENT YEARS
SAN JOAQUIN VALLEY and SACRAMENTO VALLEY 2005

	Unit	\$/Unit	Year 1		Year 2		Year 3		Year 4		Year 5			
			Total Per Acre											
			units	\$	units	\$	units	\$	units	\$	units	\$		
OPERATING COSTS														
Custom:														
Slip Plow Tree Row	acre	240.00	1.00	240										
Subsoil Row Middle	acre	150.00	1.00	150										
Disk	acre	20.00	2.00	40										
Laser Level	acre	150.00	1.00	150										
Survey, Mark, Plant	tree	2.00	48.00	96	1.00	2								
Temik Application	acre	9.00							1.00	9	1.00	9		
Shake, Sweep, Pickup	acre	Various									1.00	150		
Hull, Dry, Deliver	lb	0.07						80.00	5	300.00	20			
Leaf Analysis	acre	1.75						1.00	2	1.00	2			
PCA/Consultant Fee	acre	20.00						1.00	20	1.00	20			
Rent:														
Fertilizer Applicator	acre	5.50									2.00	11		
Tree/Tree Aids:														
Pecan Tree	tree	13.00	48.00	624	1.00	13								
Paint for Trees	tree	0.05	48.00	2	1.00	0								
Irrigation:														
Water - District	acin	4.00	20.00	80	20.00	80	48.00	192	56.00	224	56.00	224		
Fertilizer:														
Zinc Sulfate 36%	lb	0.50	16.00	8	16.00	8	24.00	12	48.00	24	48.00	24		
Urea Low Biuret	lb	0.31	8.00	2	8.00	2	12.00	4	24.00	7	24.00	7		
UN-32 (N)	lb N	0.41	6.00	2	20.00	8	30.00	12	50.00	20	100.00	41		
Herbicide:														
Treflan HFP	pint	4.75	0.45	2										
Goal 2XL	pint	16.25	2.00	33			2.00	33	2.00	33	2.00	33		
Surflan 4 AS	pint	13.07	2.00	26			2.00	26	2.00	26	2.00	26		
Roundup Ultra Max	pint	7.80	0.54	4	0.54	4	0.54	4	0.54	4	0.54	4		
Insecticide:														
Temik 15G	lb	5.23							22.00	115	22.00	115		
Dimethoate 267EC	pint	4.91							1.00	5	1.00	5		

UC COOPERATIVE EXTENSION
Table 3. COST PER ACRE TO PRODUCE PECANS
 SAN JOAQUIN VALLEY and SACRAMENTO VALLEY 2005

Operation	Operation	Cash and Labor Costs per Acre					Total Cost	Your Cost
	Time (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/Rent			
Cultural:								
Prune: Mechanical (1/2 orchard)	0.00	0	0	0	35	35		
Prune: Shred Prunings Alt Middles	0.20	3	3	0	0	6		
Weed: Spot Spray 3X (Roundup)	0.73	12	1	4	0	18		
Weed: Mow Middles 4X	1.38	23	19	0	0	42		
Irrigate 10X	1.50	14	0	224	0	238		
Fertilize: Nitrogen (UN32)	0.67	11	7	82	11	111		
Fertilize: Foliar N (Urea LB) & Zinc (Zn Sulfate) 4X	1.22	20	16	31	0	67		
Insect: Aphid Systemic (Temik)	0.00	0	0	115	9	124		
Nut Thinning: Mechanical (1/3 orchard)	0.00	0	0	0	12	12		
Leaf Analysis	0.06	1	0	0	2	2		
Insect: Aphid Foliar (Dimethoate)	0.31	5	4	5	0	14		
Weed: Tree Row (Surflan, Goal)	0.25	4	3	59	0	66		
Consultant Services	0.00	0	0	0	20	20		
Pickup: Business Use	2.00	33	18	0	0	51		
ATV General Field Use	3.00	50	5	0	0	54		
TOTAL CULTURAL COSTS	11.31	176	75	520	88	860		
Harvest:								
Shake, Sweep & Haul (1st Pick)	0.00	0	0	0	225	225		
Shake, Sweep & Haul (2nd Pick)	0.00	0	0	0	125	125		
Hull Dry & Deliver	0.00	0	0	0	130	130		
TOTAL HARVEST COSTS	0.00	0	0	0	480	480		
Interest on operating capital						29		
TOTAL OPERATING COSTS/ACRE		176	75	520	568	1,369		
CASH OVERHEAD:								
Office Expense						105		
Liability Insurance						9		
Sanitation Fees						8		
Property Taxes						77		
Property Insurance						24		
Investment Repairs						29		
TOTAL CASH OVERHEAD COSTS						252		
TOTAL CASH COSTS/ACRE						1,621		
NON-CASH OVERHEAD: (Investments)								
		Per producing Acre		Annual Cost				
				Capital Recovery				
Buildings		776		68		68		
Shop/Field Tools		216		21		21		
Flood Irrigation System		450		30		30		
Land		4,138		249		249		
Orchard Establishment		4,287		294		294		
Equipment		1,145		123		123		
TOTAL NON-CASH OVERHEAD COSTS		11,012		784		784		
TOTAL COSTS/ACRE						2,405		

UC COOPERATIVE EXTENSION
Table 4. OPERATING COSTS AND RETURNS PER ACRE TO PRODUCE PECANS
 SAN JOAQUIN VALLEY - 2005

	Quantity Total/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS - Pecans	2,000.00	lb	1.20	2,400	
Herbicide:					
Roundup Ultra Max	0.54	pint	7.80	4	
Goal 2 XL	2.00	pint	16.25	33	
Surflan 4 AS	2.00	pint	13.07	26	
Insecticide:					
Temik 15G	22.00	lb	5.23	115	
Dimethoate 267EC	1.00	pint	4.91	5	
Fertilizer:					
UN-32	200.00	lb N	0.41	82	
Urea Low Biuret (46-0-0)	24.00	lb	0.31	7	
Zinc Sulfate 36%	48.00	lb	0.50	24	
Irrigation:					
Water - District	56.00	acin	4.00	224	
Rent:					
Fertilizer Applicator	2.00	acre	5.50	11	
Custom/Contract:					
Prune - Hedge (mechanical) 1/2 orchard	0.50	acre	70.00	35	
Application-Temik	1.00	acre	9.00	9	
Nut Thinning (mechanical)	0.33	acre	35.00	12	
Harvest, Sweep, Pickup (1st pick)	1.00	acre	225.00	225	
Harvest, Sweep, Pickup (2d pick)	1.00	acre	125.00	125	
Hull, Dry, Deliver	2,000.00	lb	0.07	130	
Leaf Analysis	1.00	acre	1.75	2	
PCA Fees	1.00	acre	20.00	20	
Labor (machine)	11.70	hrs	13.80	161	
Labor (non-machine)	1.56	hrs	9.32	15	
Fuel - Gas	8.52	gal	2.05	17	
Fuel - Diesel	18.46	gal	1.51	28	
Lube				7	
Machinery repair				23	
Interest on operating capital @ 7.65%				29	
TOTAL OPERATING COSTS/ACRE				1,369	
NET RETURNS ABOVE OPERATING COSTS				1,031	
CASH OVERHEAD COSTS:					
Office Expense				105	
Liability Insurance				9	
Sanitation Fees				8	
Property Taxes				77	
Property Insurance				24	
Investment Repairs				29	
TOTAL CASH OVERHEAD COSTS/ACRE				252	
TOTAL CASH COSTS/ACRE				1,621	
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Buildings				68	
Shop/Field Tools				21	
Flood Irrigation System				30	
Land				249	
Orchard Establishment				294	
Equipment				123	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				784	
TOTAL COSTS/ACRE				2,405	
NET RETURNS ABOVE TOTAL COSTS				-5	

UC COOPERATIVE EXTENSION
Table 5. MONTHLY CASH COSTS PER ACRE TO PRODUCE PECANS
 SAN JOAQUIN VALLEY - 2005

Beginning JAN 05	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Ending DEC 05	05	05	05	05	05	05	05	05	05	05	05	05	
Cultural:													
Prune: Mechanical (1/2 Orchard)		35											35
Prune: Shred Prunings Alt Middles		6											6
Weed: Spot Spray 3X (Roundup)				6	6		6						18
Weed: Mow Middles 4X				10	10		10		10				42
Irrigate 10X				24	48	48	48	48	24				238
Fertilize: Nitrogen (UN32)					55			55					111
Fertilize: Foliar 4X N (Urea) & Zinc (ZnSO4)					17	34	17						67
Insect: Aphid Systemic (Temik)						124							124
Nut Thinning: Mechanical							12						12
Leaf Analysis							2						2
Insect: Aphid Foliar (Dimethoate)									14				14
Weed: Tree Row (Surflan, Goal)											66		66
Consultant Services	2	2	2	2	2	2	2	2	2	2	2		20
Pickup Truck Use	4	4	4	4	4	4	4	4	4	4	4	4	51
ATV Use	5	5	5	5	5	5	5	5	5	5	5	5	54
TOTAL CULTURAL COSTS	11	52	11	51	147	216	105	114	59	11	76	9	860
Harvest:													
Shake, Sweep & Haul (1st Pick)									225				225
Shake, Sweep & Haul (2nd Pick)										125			125
Hull Dry & Deliver									104	26			130
TOTAL HARVEST COSTS									329	151			480
Interest on operating capital @ 7.65%	0	0	0	1	2	3	4	4	7	8	0	0	29
TOTAL OPERATING COSTS/ACRE	11	52	11	52	149	219	109	118	395	170	76	9	1,369
OVERHEAD (Capital Recovery):													
Office Expense	9	9	9	9	9	9	9	9	9	9	9	9	105
Liability Insurance										9			9
Sanitation Fees	1	1	1	1	1	1	1	1	1	1	1		8
Property Taxes	38						38						77
Property Insurance	12						12						24
Investment Repairs	2	2	2	2	2	2	2	2	2	2	2	2	29
TOTAL CASH OVERHEAD COSTS	62	12	12	12	12	12	62	12	12	21	12	11	252
TOTAL CASH COSTS/ACRE	73	64	23	63	160	231	171	130	407	190	88	20	1,621

UC COOPERATIVE EXTENSION
Table 6. RANGING ANALYSIS
 SAN JOAQUIN VALLEY AND SACRAMENTO VALLEY 2005

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE PECANS

	YIELD (lb/acre)						
	1,400	1,600	1,800	2,000	2,200	2,400	2,600
OPERATING COSTS/ACRE:							
Cultural Cost	860	860	860	860	860	860	860
Harvest Cost	441	454	467	480	493	506	519
Interest on operating capital	29	29	29	29	29	29	30
TOTAL OPERATING COSTS/ACRE	1,330	1,343	1,356	1,369	1,382	1,395	1,409
TOTAL OPERATING COSTS/LB	0.95	0.84	0.75	0.68	0.63	0.58	0.54
Cash Overhead Costs/Acre	252	252	252	252	252	252	252
TOTAL CASH COSTS/ACRE	1,582	1,595	1,608	1,621	1,634	1,647	1,661
TOTAL CASH COSTS/LB	1.13	1.00	0.89	0.81	0.74	0.69	0.64
Non-Cash Overhead Costs/acre	784	784	784	784	784	784	784
TOTAL COSTS/ACRE	2,367	2,380	2,393	2,406	2,419	2,432	2,446
TOTAL COSTS/LB	1.69	1.49	1.33	1.20	1.10	1.01	0.94

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE \$/lb	YIELD (lb/acre)						
	1,400	1,600	1,800	2,000	2,200	2,400	2,600
0.80	-210	-63	84	231	378	525	671
0.90	-70	97	264	431	598	765	931
1.00	70	257	444	631	818	1,005	1,191
1.10	210	417	624	831	1,038	1,245	1,451
1.20	350	577	804	1,031	1,258	1,485	1,711
1.30	490	737	984	1,231	1,478	1,725	1,971
1.40	630	897	1,164	1,431	1,698	1,965	2,231

NET RETURN PER ACRE ABOVE CASH COST

PRICE \$/lb	YIELD (lb/acre)						
	1,400	1,600	1,800	2,000	2,200	2,400	2,600
0.80	-462	-315	-168	-21	126	273	419
0.90	-322	-155	12	179	346	513	679
1.00	-182	5	192	379	566	753	939
1.10	-42	165	372	579	786	993	1,199
1.20	98	325	552	779	1,006	1,233	1,459
1.30	238	485	732	979	1,226	1,473	1,719
1.40	378	645	912	1,179	1,446	1,713	1,979

NET RETURNS PER ACRE ABOVE TOTAL COST

PRICE \$/lb	YIELD (lb/acre)						
	1,400	1,600	1,800	2,000	2,200	2,400	2,600
0.80	-1,247	-1,100	-953	-806	-659	-512	-366
0.90	-1,107	-940	-773	-606	-439	-272	-106
1.00	-967	-780	-593	-406	-219	-32	154
1.10	-827	-620	-413	-206	1	208	414
1.20	-687	-460	-233	-6	221	448	674
1.30	-547	-300	-53	194	441	688	934
1.40	-407	-140	127	394	661	928	1,194

UC COOPERATIVE EXTENSION

Table 7. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS
SAN JOAQUIN VALLEY - 2005

ANNUAL EQUIPMENT COSTS

Yr Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
					Insur- ance	Taxes	
05 85 HP MWFD Tractor	55,000	25	4,651	4,222	206	298	4,726
05 ATV 4WD	5,790	7	2,196	776	28	40	843
05 Mower - Flail 10'	8,502	10	1,504	1,042	35	50	1,126
05 Orchard Sprayer 500 Gal	19,741	10	3,491	2,419	80	116	2,615
05 Pickup Truck - 1/2 ton	17,240	7	1,724	2,884	65	95	3,044
05 Spot Sprayer for ATV 20 Gal	511	10	90	63	2	3	68
05 Weed Sprayer 100 Gal	3,947	10	698	484	16	23	523
TOTAL	110,731		14,354	11,890	432	625	12,946
60% of New Cost *	66,439		8,612	7,133	259	375	7,767

*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	
Buildings	45,000	20		3,926	155	225	900	5,207
Flood Irrigation System	26,100	40		1,737	90	131	522	2,479
Land 60 acres	240,000	40	240,000	14,424	0	2,400	0	16,824
Orchard Establishment	248,646	36		17,026	858	1,243	0	19,127
Shop/Field Tools	12,500	15	1,250	1,234	47	69	250	1,600
TOTAL INVESTMENT	572,246		241,250	38,347	1,150	4,068	1,672	45,237

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	60	acre	8.82	529
Office Expense	58	acre	105.00	6,090
Sanitation Fees	58	acre	8.10	470

UC COOPERATIVE EXTENSION
Table 8. HOURLY EQUIPMENT COSTS
 SAN JOAQUIN VALLEY - 2005

Yr Description	COSTS PER HOUR							Total Costs/hr
	Actual Hours Used	Capital Recovery	Cash Overhead		Operating		Total Oper.	
			Insur- ance	Taxes	Repairs	Fuel & Lube		
05 85 HP MFWD Tractor	256.60	9.87	0.48	0.70	2.12	7.25	9.37	20.42
05 ATV 4WD	216.10	2.15	0.08	0.11	0.43	1.18	1.61	3.95
05 Mower - Flail 10'	91.40	6.84	0.23	0.33	3.53	0.00	3.53	10.92
05 Orchard Sprayer 500 Gal	88.80	16.35	0.54	0.79	2.47	0.00	2.47	20.15
05 Pickup Truck - 1/2 ton	116.00	14.92	0.34	0.49	1.27	7.86	9.13	24.87
05 Spot Sprayer for ATV 20 Gal	42.10	0.89	0.03	0.04	0.14	0.00	0.14	1.10
05 Weed Sprayer 100 Gal	14.50	20.01	0.66	0.96	1.06	0.00	1.06	22.69

UC COOPERATIVE EXTENSION
Table 9. OPERATIONS WITH EQUIPMENT
 SAN JOAQUIN VALLEY and SACRAMENTO VALLEY 2005

Operation	Month	Equipment		Material	Rate/ Broadcast Acre	Unit
		Tractor	Implement			
Cultural:						
Prune: Mechanical (1/2 orchard)	February	Custom				
Prune: Shred Prunings Alternate Middles	February	85 HP MFWD	Mower - Flail 10'			
Weed: Spot Spray 3X	April	ATV 4WD	ATV Spot Sprayer	Roundup	0.18	pt
	May	ATV 4WD	ATV Spot Sprayer	Roundup	0.18	pt
	July	ATV 4WD	ATV Spot Sprayer	Roundup	0.18	pt
Mow Middles 4X	April	85 HP MFWD	Mower - Flail 10'			
	May	85 HP MFWD	Mower - Flail 10'			
	July	85 HP MFWD	Mower - Flail 10'			
	September	85 HP MFWD	Mower - Flail 10'			
Irrigate 10X	April			Water	5.60	acin
	May			Water	11.20	acin
	June			Water	11.20	acin
	July			Water	11.20	acin
	August			Water	11.20	acin
	September			Water	5.60	acin
Fertilizer: Nitrogen	May	85 HP MFWD	Fertilizer Applicator	UN-32	100.00	lb N
	August	86 HP MFWD	Fertilizer Applicator	UN-33	100.00	lb N
Fertilizer: Foliar 4X	May	85HP MFWD	Orchard Sprayer	Urea Low Biuret	6.00	lb
				Zinc Sulfate	12.00	lb
	June	85HP MFWD	Orchard Sprayer	Urea Low Biuret	6.00	lb
				Zinc Sulfate	12.00	lb
	June	85HP MFWD	Orchard Sprayer	Urea Low Biuret	6.00	lb
				Zinc Sulfate	12.00	lb
	July	85HP MFWD	Orchard Sprayer	Urea Low Biuret	6.00	lb
				Zinc Sulfate	12.00	lb
Fertilizer: Leaf Analysis	July	Custom				
Insect: Aphid (systemic)	June	Custom		Temik	22.00	lb
Insect: Aphid (foliar)	September	85 HP MFWD	Orchard Sprayer	Dimethoate	1.00	pt
Nut Thinning	July	Custom				
Weed: Tree Row	November	85 HP MFWD	Weed Sprayer	Surflan	2.00	pt
				Goal	2.00	pt
Harvest Shake Sweep Pickup 1st Pick	September	Custom				
Harvest Shake Sweep Pickup 2d Pick	October	Custom				
Hull Dry Deliver	September	Custom				
	October	Custom				