UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2012

SAMPLE COSTS TO ESTABLISH A WALNUT ORCHARD AND PRODUCE

WALNUTS

English Walnuts

SACRAMENTO VALLEY

Micro-Sprinkler Irrigated

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SAMPLE COSTS TO ESTABLISH a WALNUT ORCHARD and PRODUCE WALNUTS Sacramento Valley – 2012

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INTRODUCTION

Sample costs to establish a walnut orchard and produce walnuts under micro sprinkler irrigation in 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. Practices described are based on those production practices considered typical for the crop and area, but will not apply to every farm. Sample costs for labor, materials, equipment and custom services are based on current figures. A blank column, "*Your Costs*", in Tables 2 and 3 is provided to enter your farming costs.

The assumptions section describes the hypothetical farm operation, production practices, overhead, and calculations. 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 are available for many commodities. Current and archived studies can be downloaded from the Agricultural and Resource Economics website at UC Davis http://coststudies.ucdavis.edu. These studies as well as archived studies not on the website can be requested through the department by calling (530) 752-1517.

ASSUMPTIONS

The assumptions refer to Tables 1 through 8 and pertain to sample costs to establish an orchard and produce walnuts under micro sprinkler or low volume irrigation in the Sacramento Valley. The cultural practices described represent production operations and materials considered typical for a well managed farm in the Sacramento Valley. Costs, materials, and practices in this study will not apply to all farms. Timing of and types of cultural practices will vary by location and by season depending upon weather, soil, insect and disease pressure. The study is intended as a guide only. **The use of trade names and cultural practices 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 105 contiguous acres farmed by the owner. Smaller non-contiguous parcels may have additional costs for travel time and equipment re-calibration. Walnuts are established on 100 acres; roads, irrigation systems and farmstead occupy five acres.

Establishment Cultural Practices and Material Inputs
(Table 1)

Site Preparation. This orchard is established on ground previously planted to another tree crop. The soil is ripped 3-feet deep in two directions to break up underlying hardpan and pull up old roots. The orchard site is disced twice to break up clods, then floated twice to level and smooth the surface. The area is fumigated, untarped, solid with Telone C35. Berms in the tree row are formed with the grower's tractor and ridger. A herbicide is then applied prior to planting. Contract or custom operators do both ripping and fumigation. All operations that prepare the orchard for planting are done in the year prior to planting, but costs are shown in the first year.

Trees. No specific variety of English walnut is planted in this study. Cultivars typically planted in the Sacramento Valley include Chandler, Howard and Tulare. Many orchards include a small percentage of a second variety for pollination. Paradox is the typical rootstock in the Sacramento Valley. Many variables determine spacing including soil, rootstock and variety planted. In this study, 3/4 inch caliber nursery grafted trees costing $16.35 per tree are planted at 24 X 28 foot spacing, resulting in 65 trees per acre. The economic life of the orchard is assumed to be 35 years. Some growers plant June budded trees at $9.00 per tree. June budded trees and clonal rootstock is gaining popularity.

Planting. Planting in the spring (February/March) starts by surveying and marking tree sites with a small stake, digging holes, planting, staking the trees, and cutting back to 3 to 5 buds. Trees are painted white to prevent sunburn and tree wraps are placed around the tree to protect them from contact herbicides. In the second year, 4% of the orchard or 2 trees per acre are replanted.

Training. Training and pruning begins in the spring (April) after planting. One shoot that forms the main trunk is selected and tied up the tree stake. Summer training in the first year consists of tying the main trunk, tipping back competing shoots and suckering. Dormant pruning/training (March) during the second and third years develops primary and secondary (third year) scaffolds and encourages the central leader. Starting in February of the fourth year, pruning towers are used to make cuts higher in the tree canopy. Heading cuts are made to remove a portion of the current year's growth on scaffold branches until trees fill in their spaces. Starting in the seventh year, pruning is done once every third year and one-third of the costs are shown each year. During the first two establishment years, the brush is placed in the row middles and chopped during the first mowing. In the following years, the brush is chopped in a separate operation.

Fertilization. Nitrogen is the major nutrient required for tree growth and production. Some locations will require additional nutrients. For the first two years, two equal applications of granular nitrogen are hand applied in April and August approximately 18 inches from the base of the tree. Beginning in third year, liquid nitrogen fertilizer (UN32) is injected through the irrigation system. Estimated annual rates of actual N are shown in Table A.

Table A. Applied N

Year	Actual N lbs/acre
1	20
2	50
3	100
4	125
5	150
6+	200

Leaf Samples. Leaf sampling begins in the fourth year. One leaf sample per 25 acres is taken in July for tissue analysis to determine orchard nutritional status. Samples are collected using an ATV to move through the orchard. Time assumed is 0.04 hours per acre to collect and package the samples.

Irrigation. Price per acre-foot of water will vary by grower depending on power source, well characteristics, and irrigation district. In this study, electrical costs for pumping ground water are calculated to cost $42.00 per acre-foot or $3.50 per acre-inch. No assumption is made about effective rainfall. The estimated water applied each year is shown in Table B**.**

Table B. Applied Water

Year	acft/year
1	1.5
2-5	2.5
6+	3.0

Pest Management. The pesticides and rates mentioned in this cost study are listed in *UC Integrated Pest Management Guidelines, Walnuts.* See the Integrated Pest Management (IPM) website http://ipm.ucdavis.edu for other materials available.

Nematodes/Fumigation. Prior to land preparation, the area is sampled (1 sample/10 acres) for nematodes. The grower uses the ATV for moving around the field. Two hours per 100 acres are assumed for collecting and packaging the samples. Fumigation (Telone and chloropicrin) is done untarped by a custom applicator. Fumigation may be necessary where orchards follow orchards, but not be necessary following bare or row crop ground. See http://uckac.edu/programs/nematodes.

Weeds. Weed pressure, materials and application timing will vary by orchard and season. In this study, a contact herbicide (Roundup) is applied to the tree rows in February prior to planting and a preemergence herbicide (Prowl) is applied in April. Beginning in the first year, the row middles are mowed five times - April, May, June, July, August. During the first two years, early winter (November) strip sprays using Prowl and Goal are applied. Inseason sprays using Roundup are applied to tree rows in July of the first year and in June during year's two to five followed by Rely in August. In subsequent years, Prowl, Goal, and Roundup are applied as winter (November) strip sprays. Inseason strip sprays using Rely are applied in July for weed control in year's six to eight.

Diseases. During the establishment years, trees have only a few walnuts to protect from walnut blight. In this study, blight sprays begin in April of the fourth year. Two applications are made using a copper fungicide (Kocide) and Manzate (check registration status before using) tank mix.

Insects. In the first through third year, an infestation of redhumped caterpillars is possible and treated in June with one application of Dipel. Codling moth is assumed to reach treatment levels by the fifth year. Lorsban is applied once in May for codling moth control. Beginning in the sixth year, walnut husk fly is treated twice, once in July with Malathion and Nu-Lure bait and once in August with Asana (pyrethoid) and Nu-Lure. Also, other insects such as aphids, scale, or mites can reach treatment levels. For this study it is assumed that on the average, only one of these pests will occur in any one year. Under that assumption, mites are treated in July with Omite. The cost is assumed to be equivalent to the average costs of controlling the other insects.

Vertebrate Pests. Beginning in the first year, gophers are managed in the spring (March) using poison bait placed underground by a mechanical bait applicator. It is assumed that gophers are under control by the end of the third year and in subsequent years only spot treatments are necessary. Squirrels are managed using anti-coagulant bait stations on the field perimeter beginning in the fifth year and are maintained during May, June, September and October. See http://ucanr.org/sites/Ground_Squirrel_BMP/.

Harvest. Depending upon variety and orchard management, harvest usually starts in the fourth or fifth year. In this study, economical harvest starts in the fourth year. A custom operator mechanically shakes, sweeps, picks up and hauls walnuts to a facility for hulling and drying. Mature yield is reached in the eighth year. See harvest under the production assumptions.

Table C. Annual Yields

	Yield (dry, In-shell)	
Year	ton/acre	lb/acre
4	0.25	500
5	0.50	1,000
6	0.75	1,500
7	1.40	2,800
8+	2.70	5,400

Production Cultural Practices and Material Inputs
(Table 2 – 8)

Pruning. Pruning to maintain light for healthy buds, lower tree height, remove dead and undesired limbs is done during the winter months. The trees are hedged by a custom operator between December and March (February in this study) once every three years and one-third of the cost is included each year. Hand pruning is done each year in July to remove low and broken limbs. In both cases, prunings are placed in the row middles and are pushed to the orchard edge for burning. Brush removal includes the tractor driver and one man on the ground.

Fertilization. Nitrogen (N) at an annual rate of 200 pounds per acre of actual N is applied through the irrigation system. The nitrogen source is UN 32 injected through the irrigation system in equal amounts in April and August. Labor for the fertilizer application is included in the irrigation labor.

Leaf Samples. Nutrition is determined by leaf analysis. Leaf samples at one sample per 25 acres are taken in July for tissue analysis. The grower uses the ATV to move around the field. Time assumed is 0.04 hours per acre to collect and package the samples.

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Irrigation. Irrigation costs include the water pumping costs and assumed labor. The crop uses 42-acre inches of water per acre, 36-acre inches are applied from April to August. The remaining water is from soil moisture from winter rains. Water costs based on grower input are $42.00 per acre-foot or $3.50 per acre-inch.

Pest Management. The pesticides and rates mentioned in this cost study are listed in *UC Integrated Pest Management Guidelines, Walnuts.* For additional information on suggested pesticides, 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. Adjuvants or surfactants may be recommended for use with some pesticides, but are not included in this study. Pesticide costs vary by location and amount purchased. **Pesticide costs in this study are the average or typical cost paid by the growers participating in the survey.**

Pest Control Adviser (PCA). In this study a PCA monitors for pest problems including but not limited to insects, weeds and nutrition and writes specific pesticide recommendations. Growers may hire private PCAs or receive the service as part of a service agreement with an agricultural chemical and fertilizer company.

*Weeds***.** Weeds are controlled in the tree row with winter and in-season strip sprays using preemergent/postemergent and contact herbicides. Goal, Prowl and Roundup are applied in November (winter strip spray). Rely is applied during the growing season (inseason strip spray) in July. Row middles are mowed five times from April through August.

Insects. Several insects and mites can be a problem. Codling moth, a major pest, can cause damage resulting in off grade nuts. Three generations usually occur and are monitored using pheromone traps and insect degree days (IPM web site). The pheromone traps are furnished, installed and serviced by the PCA, therefore no cost is shown. Two treatments for codling moth are assumed, Lorsban is applied in May and Asana in July. Walnut husk fly is a problem in most orchards and is monitored using yellow sticky traps with ammonium carbonate superchargers. Husk fly is treated in July with Malathion and Nu-Lure Bait and in August with Asana and Nu-Lure Bait. Aphids, scale, and/or mites generally do not occur every year in every orchard. In this study, it is assumed on the average only one of these pests will appear in any year and one treatment per year is considered necessary. Although different materials are required to control each pest, Omite for mites is applied in June and represents the average cost for controlling the other insects. Growers should rotate pesticides used for pest control to prevent resistance buildup. Many growers with orchards 40 acres or larger, use puffers for pheromone mating disruption of codling moth but those costs are not included in this study.

Disease. Walnut Blight is a spring disease that infects all green tissue including the nutlets and is the only disease treated in this study. Three treatments are applied, two in April and one in May, using a copper compound (Kocide) tank mixed with Manzate (check registration status before using).

Vertebrate Pests. Gophers require control and maintenance treatments are necessary. Spot treatments with gopher bait are made in March. Squirrels are managed using anti-coagulant bait stations on the field perimeter and are maintained during May, June, September and October. In both situations, the grower uses an ATV to move around the field.

Growth Regulator. Ethephon is applied to one-half of the orchard to promote earlier harvest. The growth regulator (Ethephon) is applied at packing tissue brown (an indicator of kernel maturity) to promote earlier harvest. For one shake harvest, apply about 10 days before harvest on the treated side.

Harvest. The custom harvesters shake, sweep, pick up, and truck the walnuts to a processor for hulling and drying. Hand raking is needed to windrow walnuts missed by the sweeper and the rakers are supplied by the grower. Hulling and drying costs are charged on a per pound, dry-weight basis. Custom harvest operators may charge by the hour, acre or yield, but most have a minimum per acre charge.

Yields. Annual yields for walnut varieties are measured as clean, dry, in-shell pounds per acre. The average yield over the remaining life of the orchard is assumed to be 5,400 pounds per acre.

Returns. Actual price depends on a number of factors such as demand, size of the state crop, variety, nut size, and quality. An estimated price of $1.20 per pound based on previous years is used in this study. See Table 5 for a range of yields over a range of prices.

Assessments. Under a state marketing order, the California Walnut Commission (CWC) collects mandatory assessment fees. These assessments are charged to the grower to pay for walnut marketing, advertising, and research programs. The CWC has a current fee of $0.009 per pound of dry in-shell nuts.

Miscellaneous Labor. Labor that may be used for short periods assisting various operations. The operation was completed before the end of the workday; therefore the grower may assign miscellaneous duties such as weeding around the shop or equipment yard. Also covers extra labor that may be needed in one of the operations or in the shop and has not been accounted for in that specific operation.

Pickup/ATV. The study assumes business use mileage of 3,000 miles per year for the pickup. The ATV is used for weed spraying, baiting squirrels and gophers and is included in those costs. Additional ATV uses for checking the orchard, diseases and irrigation system are shown as a line item. The travel and time are estimated and not taken from any specific data.

Labor, Equipment, and Interest

Labor. Hourly wages for workers are $12.50 for machine operators and $9.00 per hour non-machine labor. Adding 33% for the employer's share of federal and state payroll taxes, workers compensation insurance for nut crops (code 0045) and other possible benefits results in labor rates of $16.63 and $11.97 per hour for machine labor and non-machine labor, respectively. 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, 2011 (California Department of Insurance). 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, work breaks, and field repair.

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 takeoff (PTO) horsepower, and fuel type. Prices for on-farm delivery of diesel and gasoline are $3.44 and $3.85 per gallon, respectively. The costs are based on January through June 2011, Department of Energy (DOE) monthly data. The cost includes a 2.5% local sales tax on diesel fuel and 7.5% 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 2 is determined by multiplying the total hourly operating cost in Table 7 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 5.75% 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. The rate will vary depending upon various factors, but the rate in this study is considered a typical lending rate by a farm lending agency as of January 2012.

Risk. The risks associated with crop production 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 profitability and economic viability.

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. Employee benefits, insurance, and payroll taxes are included in labor costs and not in overhead (see Labor).

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 two 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 0.775% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs $728 for the entire farm.

Office Expense. Office and business expenses are estimated at $120 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, road maintenance, shop and office utilities and miscellaneous administrative costs.

Sanitation Services. Sanitation services provide portable toilets with wash basins for the orchard and cost the farm $1,280 annually. This cost includes delivery and five months of weekly service.

Environmental Fees. Fees are estimated for various environmental and safety expenses.

Supervisor/Management Salaries. Wages for management are not included as a cash cost. Any return above total costs is considered a return to management and risk.

Investment Repairs. Costs are calculated as 2% of the purchase price on investments listed in Table 5 except for establishment costs are 0.10% to account for tree replacement.

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 ((Purchase Price – Salvage Value) x Capital Recovery Factor) + (Salvage Value x 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 wearout life, as given by ASAE by the annual hours of use in this operation. For other investments including irrigation systems, buildings, and miscellaneous equipment, the value at the end of its useful life is zero. The salvage value for land is the purchase price because land does not depreciate. The purchase price and salvage value for equipment and investments are shown in Table 6.

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. An interest rate of 4.75% is used to calculate capital recovery. The rate will vary depending upon loan amount and other lending agency conditions, but is the basic suggested rate by a farm lending agency as of January 2012.

Land. Crop or bare land values range from $4,000 to $8,000. The orchard site is assumed to be on previously farmed orchard ground. The basic land value in this study is $7,000 per acre.

Irrigation System. The cost is based on two 75-horsepower electric motors pumping from a depth of 75 feet. Water is pumped to the orchard, after running through a filtration station. For this study, a pump and well already exist, so the cost of the irrigation system is for recasing the well, refurbishing the pump and motor, installing a new filtration system and micro sprinklers. The new irrigation system is installed after the orchard has been laid out and prior to planting. The life of the irrigation system is estimated at 35 years.

Fuel Tanks. Two 250-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, field tools such as pruning equipment, traps, etc.

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 almond trees through the first year nuts are harvested less returns from production. The *Accumulated Net Cash Cost* in the third year shown in Table 1 represents the establishment cost per acre. For this study, this cost is $8,379 per acre or $837,900 for the 100-acre orchard. Establishment cost is amortized beginning in the fifth year over the remaining 31 years of production. Tree replacement or repairs is $8.37 per acre based on 0.10% of the establishment cost.

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 6. 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. (ASAE). 1992. *American Society of Agricultural Engineers Standards Yearbook*. St. Joseph, MO.

Boehlje, Michael D., and Vernon R. Eidman. 1984. *Farm Management*. John Wiley and Sons. New York, NY.

California Chapter of the American Society of Farm Managers and Rural Appraisers. 2011. *Trends in Agricultural Land and Lease Values.* California Chapter of the American Society of Farm Managers and Rural Appraisers, Inc. Woodbridge, CA.

California State Board of equalization. *Fuel Tax Division Tax Rates.* Internet accessed July 2011. http://www.boe.ca.gov/sptaxprog/spftdrates.htm

Energy Information Administration. 2011. *Weekly Retail on Highway Diesel Prices.* Internet accessed July 2011. http://tonto.eix.doe.gov/oog/info/wohdp

Doanes Editors. *Facts and Figures for Farmers.* 1977. Doane Publishing, St. Louis, MO. P 292.

Krueger, William H., Buchner, Richard P., John P. Edstrom, Janine K. Hasey, Karen M. Klonsky, and Richard L. De Moura. 2007. *Sample Costs to Establish and Produce Walnuts, Sacramento Valley.* University of California, Cooperative Extension. Department of Agricultural and Resource Economics. Davis, CA.

Ramos, David E. (ed.). *Walnut Production Manual*. University of California, Division of Agricultural and Natural Resources. Oakland, CA. Publication 3373.

Reil, Wilbur. 2001. *Walnut Production in Yolo and Solano Counties of California.* University of California Cooperative Extension. Woodland, CA.

Schwankl, Larry, Terry Prichard, Blaine Hanson, Ilene Wellman. 2000. *Costs of Pressurized Irrigation Systems for Tree Crops.* University of California, Division of Agriculture and Natural Resources. Oakland, CA. Publication 21585.

University of California Statewide Integrated Pest Management Program. *UC Pest Management Guidelines, Walnuts*. 2005. University of California, Davis, CA. http://www.ipm.ucdavis.edu

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For information concerning the above or other University of California publications, contact UC DANR Communications Services at 1-800-994-8849, online at www.ucop.edu, or your local county UC Cooperative Extension office.

UC COOPERATIVE EXTENSION

Table 1. COSTS PER ACRE TO ESTABLISH AN ENGLISH WALNUT ORCHARD

SACRAMENTO VALLEY - 2012

	Cost Per Acre						
Year:	1st	2nd	3rd	4th	5th	6th	7th
Yield: Dry, In-Shell Pounds Per Acre				500	1,000	1,500	2,800
Planting Costs:							
Nematode Sampling (10/100 acres)	4						
Land Preparation: Subsoil/Rip 2X, Disk 2X, Float 2X	550						
Land Preparation: Fumigate (solid, untarped)	2,500						
Land Prep: Berms	4						
Land Prep-Weed: Preplant Strip Spray (Roundup)	6						
Trees: 65 Per Acre @ $16.50 ea., (2% in 2nd year)	1,073	33					
Plant: Survey, Mark, Dig Holes & Plant	219	7					
Plant: Stake & Paint Trees	309						
TOTAL PLANTING COSTS	4,665	40					
Cultural Costs:							
Prune (Yrs 1-3 prune/train. Yrs 4+ prune, Yr 7+ prune 1X/3 yrs)	48	72	54	240	320	400	67
Fertilizer: Nitrogen (Urea, Yr 1-2. UN32, Yr 3+)	37	57	68	85	102	136	136
Weed: Strip Spray (Yr 1 Prowl, Yr 2 Rely)	18	17					
Weed: Dormant Strip (Yr 1-2, Goal, Prowl. Yr 2+, Goal, Prowl, Roundup)	43	43	46	46	46	46	46
Weed: Mow Middles 5X	46	46	46	46	46	46	46
Weed: In-Season Strip Spray (Yr 1 Roundup, 1X. Yr 2-5, Roundup 1X, Rely 1X. Yr 6+, Rely)	10	10	27	27	27	17	17
Irrigate	75	117	117	117	117	138	138
Vertebrate: Gophers (Bait)	11	11	11	4	4	4	4
Insect: Caterpillar (Dipel)	19	19	19				
Prune: Brush Disposal			13	13	13	13	4
Fertilize: Leaf Analysis				2	2	2	2
Disease: Blight (Kocide, Manzate)				105	105	105	105
Insect: Codling Moth (Lorsban)					24	24	24
Vertebrate: Squirrels (Bait)					7	7	7
Insect: Husk Fly (Malathion, Nu Lure Bait 1X) (Asana, Nu Lure 1X)						112	112
Insect: Miscellaneous Insects (Omite for mites)						37	37
Pickup Use	31	31	31	31	31	31	31
ATV use	46	46	46	46	46	46	46
Miscellaneous Labor	36	36	36	36	36	36	36
PCA Services	10	10	10	30	30	30	30
TOTAL CULTURAL COSTS	430	515	524	828	956	1,230	887
Harvest Costs:							
Shake, Sweep, Pickup				240	240	240	240
Hand Rake				9	12	12	12
Haul Walnuts to Dryer				5	10	15	28
Dry and Hull				35	70	105	196
California Walnut Commission Assessment				5	9	14	25
TOTAL HARVEST COSTS				294	341	386	501
Interest On Operating Capital @ 5.75%	311	16	15	21	25	31	19
TOTAL OPERATING COSTS/ACRE	5,406	571	539	1,143	1,322	1,647	1,407
Cash Overhead Costs:							
Office Expense	120	120	120	120	120	120	120
Liability Insurance	7	7	7	7	7	7	7
Sanitation Costs	13	13	13	13	13	13	13
Environmental Fees	1	1	1	1	1	1	1
Property Taxes	93	93	93	93	93	93	93
Property Insurance	15	15	15	15	15	15	15
Investment Repairs	81	81	81	81	81	81	81
TOTAL CASH OVERHEAD COSTS	330	330	330	330	330	330	330
TOTAL CASH COSTS/ACRE	5,736	901	869	1,473	1,652	1,977	1,737
INCOME/ACRE FROM PRODUCTION				600	1,200	1,800	3,360
NET CASH COSTS/ACRE FOR THE YEAR	5,736	901	869	873	452	177	
PROFIT/ACRE ABOVE CASH COSTS							1,622
ACCUMULATED NET CASH COSTS/ACRE	5,736	6,637	7,506	**8,379**	8,831	9,008	7,386

Table 1. continued

	Cost Per Acre						
Year:	1st	2nd	3rd	4th	5th	6th	7th
Yield: Field Run - Pounds Per Acre				500	1,000	1,500	2,800
Non-Cash Overhead (Capital Recovery):							
Buildings	68	68	68	68	68	68	68
Fuel Tanks 2-250 gal	2	2	2	2	2	2	2
Shop/Field Tools	15	15	15	15	15	15	15
Sprinkler Irrigation System	137	137	137	137	137	137	137
Land	423	423	423	423	423	423	423
Equipment	100	99	99	97	97	97	97
TOTAL INTEREST ON INVESTMENT	745	744	744	742	742	742	742
TOTAL COST/ACRE FOR THE YEAR	6,481	1,645	1,613	2,215	2,394	2,719	2,517
INCOME/ACRE FROM PRODUCTION				600	1,200	1,800	3,360
TOTAL NET COST/ACRE FOR THE YEAR	6,481	1,645	1,613	1,615	1,194	919	
NET PROFIT/ACRE ABOVE TOTAL COST							843
TOTAL ACCUMULATED NET COST/ACRE	6,481	8,126	9,739	11,354	12,548	13,467	12,624

UC COOPERATIVE EXTENSION

Table 2. COSTS PER ACRE TO PRODUCE WALNUTS

Sacramento Valley 2012

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per Acre						Your Cost
		Labor Cost	Fuel	Lube & Repairs	Material Cost	Custom/ Rent	Total Cost	
Cultural:								
Pruning: Hedging 1X/3 Yrs	0.00	0	0	0	0	20	20	
Brush Disposal(1X/3yr)Push/Burn	0.16	5	2	1	0	0	8	
Vertebrate: Gophers (bait)	0.08	2	0	0	2	0	4	
Weed: Mow Middles 5X	1.17	23	16	5	0	0	45	
Irrigate	1.00	12	0	0	126	0	138	
Disease-Blight 3X (Kocide Manzate)	0.75	15	10	5	127	0	158	
Fertilizer: Nitrogen	0.00	0	0	0	136	0	136	
Vertebrate: Squirrel (Bait)	0.16	3	0	0	4	0	7	
Insect: Codling Moth (Lorsban)	0.25	5	3	2	14	0	24	
Insect: Mites (Omite) Misc Pests	0.25	5	3	2	27	0	37	
Insect: Codling Moth (Asana)	0.25	5	3	2	69	0	80	
Prune: Summer (low branches)	2.00	24	0	0	0	0	24	
Prune: Brush Disposal (Push burn) Summer	0.50	16	7	2	0	0	25	
Insect: Husk Fly (Malathion NuLure)	0.25	5	3	2	19	0	30	
Fertilize: Leaf Analysis	0.02	0	0	0	0	1	2	
Weed: In-Season Spray (Rely)	0.25	5	3	1	7	0	17	
Insect: Husk Fly (Asana NuLure)	0.25	5	3	2	72	0	82	
Growth Regulator: (Ethephon)50%Ac	0.17	3	2	1	22	0	29	
Weed: Dormant Strip (Goal, Prowl, Roundup)	0.25	5	3	1	37	0	46	
Pickup	1.00	20	8	3	0	0	31	
ATV Use	2.00	40	5	2	0	0	46	
Miscellaneous Labor	3.00	36	0	0	0	0	36	
PCA Service	0.00	0	0	0	0	30	30	
TOTAL Cultural COSTS	13.75	234	75	30	662	51	1,052	
Harvest:								
Shake, Sweep, Pickup	0.00	0	0	0	0	240	240	
Hand Rake	1.50	18	0	0	0	0	18	
Haul to Dryer	0.00	0	0	0	0	54	54	
Hull, Dry	0.00	0	0	0	0	378	378	
CWC Assessment Fee	0.00	0	0	0	49	0	49	
TOTAL Harvest COSTS	1.50	18	0	0	49	672	739	
Interest on Operating Capital @ 5.75%							22	
TOTAL OPERATING COSTS/ACRE	15.25	252	75	30	710	723	1,812	
CASH OVERHEAD:								
Liability Insurance							7	
Office Expense							120	
Sanitation Fee							13	
Environmental Fees							1	
Property Taxes							132	
Property Insurance							45	
Investment Repairs							89	
TOTAL CASH OVERHEAD COSTS/ACRE							408	
TOTAL CASH COSTS/ACRE							2,220	

NON-CASH OVERHEAD:	Per producing Acre	Annual Cost Capital Recovery	
Buildings 2400sqft	800	68	68
Fuel Tanks 2-250g	35	2	2
Irrigation (micro sprinklers)	1,800	137	137
Land	7,350	423	423
Shop/Field Tools	150	15	15
Establishment (Orchard)	8,379	585	585
Equipment	418	45	45
TOTAL NON-CASH OVERHEAD COSTS	18,932	1,277	1,277
TOTAL COSTS/ACRE			3,497

UC COOPERATIVE EXTENSION

Table 3. COSTS AND RETURNS PER ACRE TO PRODUCE WALNUTS

Sacramento Valley 2012

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Costs
GROSS RETURNS					
Walnuts	5,400.00	lb	1.20	6,480	
TOTAL GROSS RETURNS	5,400.00	lb		6,480	
OPERATING COSTS					
Herbicide:				44	
Rely 200	0.75	pt	9.72	7	
Goal 2XL	2.50	pt	7.96	20	
Prowl H20	3.13	pt	4.50	14	
Roundup Power Max	1.30	pt	2.06	3	
Insecticide:				201	
Lorsban 4E	4.00	pt	3.39	14	
Omite 30W	5.00	lb	5.39	27	
Asana XL	8.00	floz	17.33	139	
Malathion 5EC	3.00	pt	5.60	17	
Nu Lure Bait	2.00	pt	2.56	5	
Fungicide:				**127**	
Kocide 3000	15.00	lb	5.70	86	
Manzate	10.89	pt	3.82	42	
Rodenticide:				5	
Rodent Bait-Wilco	0.25	lb	7.00	2	
Squirrel Bait-Wilco	0.60	lb	6.04	4	
Harvest Aid:				**22**	
Ethephon	2.50	pt	8.92	22	
Custom:				**723**	
Hedge Trees	0.33	acre	60.00	20	
Leaf Analysis	0.04	each	35.00	1	
Shake, Sweep, Pickup	1.00	acre	240.00	240	
Haul Nuts	2.70	ton	20.00	54	
Dry/Hull Walnuts	5,400.00	lb	0.07	378	
PCA Service	1.00	acre	30.00	30	
Irrigation:				**126**	
Water - Pump	36.00	acin	3.50	126	
Fertilizer:				**136**	
UN-32	200.00	lb N	0.68	136	
Assessment:				**49**	
CA Walnut Commission ($0.009)	5,400.00	lb	0.01	49	
Labor:				**252**	
Equipment Operator Labor	9.30	hrs	16.63	155	
Non-Machine Labor	8.16	hrs	11.97	98	
Machinery:				**105**	
Fuel-Gas	3.41	gal	3.85	13	
Fuel-Diesel	17.93	gal	3.44	62	
Lube				11	
Machinery Repair				19	
Interest on Operating Capital (5.75%)				22	
TOTAL OPERATING COSTS/ACRE				1,812	
NET RETURNS ABOVE OPERATING COSTS				4,668	
CASH OVERHEAD COSTS					
Liability Insurance				7	
Office Expense				120	
Sanitation Fee				13	
Environmental Fees				1	
Property Taxes				132	
Property Insurance				45	
Investment Repairs				89	
TOTAL CASH OVERHEAD COSTS/ACRE				408	
TOTAL CASH COSTS/ACRE				2,220	

UC COOPERATIVE EXTENSION

Table 3. continued

Sacramento Valley 2012

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Costs
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Buildings 2400sqft				68	
Fuel Tanks 2-250 g				2	
Irrigation (micro sprinklers)				137	
Land				423	
Shop/Field Tools				15	
Establishment				585	
Equipment				45	
TOTAL NON-CASH OVERHEAD COSTS				1,277	
TOTAL COST/ACRE				3,497	
NET RETURNS ABOVE TOTAL COST				2,983	

UC COOPERATIVE EXTENSION

Table 4. MONTHLY CASH COSTS PER ACRE TO PRODUCE WALNUTS

Sacramento Valley 2012

Beginning 01-12 Ending 12-12	JAN 12	FEB 12	MAR 12	APR 12	MAY 12	JUN 12	JUL 12	AUG 12	SEP 12	OCT 12	NOV 12	DEC 12	TOTAL
Cultural:													
Pruning: Hedging 1/3 Yr		20											20
Prune: Brush Disposal (1X/3yr) (Push Burn)		8											8
Vertebrate: Gophers (bait)			4										4
Weed: Mow Middles 5X				9	9	9	9	9					45
Irrigate				28	28	28	28	28					138
Disease: Blight 3X (Kocide Manzate)				105	53								158
Fertilize: Nitrogen					68			68					136
Vertebrate: Squirrel (Bait)					2	2			2	2			7
Insect: Codling Moth (Lorsban)					24								24
Insect: Mites (Omite) Misc Pests						37							37
Insect: Codling Moth (Asana)							80						80
Prune: Summer (low branches)							24						24
Prune: Brush Disposal (Push Burn) Summer							25						25
Insect: Husk Fly (Malathion NuLure)							30						30
Fertilize: Leaf Analysis							2						2
Weed: In-Season Spray (Rely)								17					17
Insect: Husk Fly (Asana NuLure)								82					82
Growth Regulator (Ethephon)50%Ac								29					29
Weed-Dormant Strip (Goal Prow Roundup)											46		46
Pickup	3	3	3	3	3	3	3	3	3	3	3	3	31
ATV Use	4	4	4	4	4	4	4	4	4	4	4	4	46
Miscellaneous Labor	3	3	3	3	3	3	3	3	3	3	3	3	36
PCA Service	3	3	3	3	3	3	3	3	3	3	3		30
TOTAL Cultural COSTS	12	40	16	154	195	88	208	244	14	14	58	9	1,052
Harvest:													
Shake, Sweep, Pickup									240				240
Hand Rake									18				18
Haul to Dryer									54				54
Hull, Dry									378				378
CWC Assessment Fee									49				49
TOTAL Harvest COSTS	0	0	0	0	0	0	0	0	739	0	0	0	739
Interest on Operating Capital (5.75%)	0	0	0	1	2	2	3	5	8	0	0	0	21
TOTAL OPERATING COSTS/ACRE	12	40	16	155	197	90	212	249	761	14	58	9	1,812
CASH OVERHEAD													
Liability Insurance		7											7
Office Expense	10	10	10	10	10	10	10	10	10	10	10	10	120
Sanitation Fee				13									13
Environmental Fee				1									1
Property Taxes													132
Property Insurance													45
Investment Repairs	7	7	7	7	7	7	7	7	7	7	7	7	89
TOTAL CASH OVERHEAD COSTS	17	25	17	31	17	17	17	17	17	17	17	17	408
TOTAL CASH COSTS/ACRE	30	65	34	186	214	108	229	266	778	31	75	27	2,220

UC COOPERATIVE EXTENSION

Table 5. RANGING ANALYSIS

Sacramento Valley 2012

COST PER ACRE AT VARYING YIELDS TO PRODUCE WALNUTS

	YIELD (lbs/acre)						
	2,400	3,400	4,400	5,400	6,400	7,400	8,400
OPERATING COSTS:							
Cultural	1,052	1,052	1,052	1,052	1,052	1,052	1,052
Harvest	472	561	650	739	828	917	1,006
Interest on operating capital @ 5.75%	20	21	21	22	22	23	23
TOTAL OPERATING COSTS/ACRE	1,544	1,634	1,723	1,812	1,902	1,991	2,081
Total Operating Costs/lb	0.64	0.48	0.39	0.34	0.30	0.27	0.25
CASH OVERHEAD COSTS/ACRE	408	408	408	408	408	408	408
TOTAL CASH COSTS/ACRE	1,952	2,041	2,131	2,220	2,310	2,399	2,488
Total Cash Costs/lb	0.81	0.60	0.48	0.41	0.36	0.32	0.30
NON-CASH OVERHEAD COSTS/ACRE	1,277	1,277	1,277	1,277	1,277	1,277	1,277
TOTAL COSTS/ACRE	3,228	3,318	3,407	3,497	3,586	3,676	3,765
Total Costs/lb	1.35	0.98	0.77	0.65	0.56	0.50	0.45

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE($/lb)	YIELD(lb/acre)						
	2,400	3,400	4,400	5,400	6,400	7,400	8,400
0.90	616	1,426	2,237	3,048	3,858	4,669	5,479
1.00	856	1,766	2,677	3,588	4,498	5,409	6,319
1.10	1,096	2,106	3,117	4,128	5,138	6,149	7,159
1.20	1,336	2,446	3,557	4,668	5,778	6,889	7,999
1.30	1,576	2,786	3,997	5,208	6,418	7,629	8,839
1.40	1,816	3,126	4,437	5,748	7,058	8,369	9,679
1.50	2,056	3,466	4,877	6,288	7,698	9,109	10,519

NET RETURNS PER ACRE ABOVE CASH COSTS

PRICE($/lb)	YIELD(lb/acre)						
	2,400	3,400	4,400	5,400	6,400	7,400	8,400
0.90	208	1,019	1,829	2,640	3,450	4,261	5,072
1.00	448	1,359	2,269	3,180	4,090	5,001	5,912
1.10	688	1,699	2,709	3,720	4,730	5,741	6,752
1.20	928	2,039	3,149	4,260	5,370	6,481	7,592
1.30	1,168	2,379	3,589	4,800	6,010	7,221	8,432
1.40	1,408	2,719	4,029	5,340	6,650	7,961	9,272
1.50	1,648	3,059	4,469	5,880	7,290	8,701	10,112

NET RETURNS PER ACRE ABOVE TOTAL COSTS

PRICE($/lb)	YIELD(lb/acre)						
	2,400	3,400	4,400	5,400	6,400	7,400	8,400
0.90	-1,068	-258	553	1,363	2,174	2,984	3,795
1.00	-828	82	993	1,903	2,814	3,724	4,635
1.10	-588	422	1,433	2,443	3,454	4,464	5,475
1.20	-348	762	1,873	2,983	4,094	5,204	6,315
1.30	-108	1,102	2,313	3,523	4,734	5,944	7,155
1.40	132	1,442	2,753	4,063	5,374	6,684	7,995
1.50	372	1,782	3,193	4,603	6,014	7,424	8,835

UC COOPERATIVE EXTENSION

Table 6. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS

Sacramento Valley 2012

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur-ance	Taxes	Total
11	65HP 2WD Trac	46,230	12	11,558	4,744	224	289	5,257
11	75HP MFWD	43,500	15	8,469	4,035	201	260	4,496
11	ATV	5,790	12	1,448	594	28	36	658
11	Brush Rake 9'	2,000	25	57	152	8	10	170
11	Loader Forks	810	15	78	79	3	4	87
11	Mower - Flail 10'	5,000	10	500	633	21	28	682
11	Orch.Sprayer 500 G	21,000	10	3,714	2,534	96	124	2,754
11	Pickup 1/2 Ton	28,000	10	8,271	3,124	141	181	3,446
11	Weed Sprayer 100 G	4,000	10	707	483	18	24	525
TOTAL		156,330		34,801	16,378	741	956	18,074
60% of new cost*		93,798		20,880	9,827	444	573	10,845

*Used to reflect a mix of new and used equipment

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead Insur-ance	Taxes	Repairs	Total
INVESTMENT								
Buildings 2400sqft	80,000	20	0	6,834	310	400	1,600	9,144
Fuel Tanks 2-250g	3,500	35	1,295	222	19	24	70	335
Irrigation System/micro	180,000	25	0	13,748	698	900	3,440	18,786
Land	735,000	35	735,000	42,263	0	7,350	0	49,613
Shop/Field Tools	15,000	15	0	1,519	58	75	3,000	4,652
Establishment (Orchard)	837,900	31	0	58,522	3,247	4,190	838	66,796
TOTAL INVESTMENT	1,851,400		736,295	123,108	4,331	12,938	8,948	149,325

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	100	acre	7.28	728
Office Expense	100	acre	120.00	12,000
Sanitation Fee	100	acre	12.80	1,280
Environmental Fee	100	acre	1.00	100

UC COOPERATIVE EXTENSION

Table 7. HOURLY EQUIPMENT COSTS

Sacramento Valley 2012

Yr	Description	Walnut Hours Used	Total Hours Used	COSTS PER HOUR Capital Recovery	Cash Overhead Insur-ance	Taxes	Operating Lube & Repairs	Fuel	Total Oper.	Total Costs/Hr.
11	65HP 2WD Trac	55	1,000	2.85	0.13	0.17	3.72	10.98	14.70	17.85
11	75HP MFWD	439	1,066	2.27	0.11	0.15	2.98	12.67	15.65	18.18
11	ATV	226	226	1.58	0.07	0.10	0.67	2.41	3.07	4.82
11	Brush Rake 9'	66	80	1.14	0.06	0.08	0.35	0.00	0.35	1.63
11	Loader Forks	66	133	0.35	0.02	0.02	0.16	0.00	0.16	0.55
11	Mower - Flail 10'	117	117	3.26	0.11	0.14	0.75	0.00	0.75	4.26
11	Orch.Sprayer 500 G	217	217	7.02	0.27	0.34	3.30	0.00	3.30	10.93
11	Pickup 1/2 Ton	100	200	9.37	0.42	0.54	3.18	7.70	10.88	21.22
11	Weed Sprayer 100 G	50	150	1.93	0.07	0.09	1.07	0.00	1.07	3.17

UC COOPERATIVE EXTENSION

Table 8. WALNUT OPERATIONS WITH EQUIPMENT

Sacramento Valley 2012

Operation	Operation Month	Tractor	Implement	Labor Type	Labor Hours	Material	Rate/ acre	Unit
Year Start January P	Jan							
Pruning: Hedging 1/3 Yr	Feb					Hedge Trees	0.33	acre
Brush Disposal(1X/3 yr)Push Burn	Feb	75HP MFWD	Loader Forks Brush Rake 9'	Non-Machine Labor	0.16			
Pest-Gophers (bait)	Mar		ATV	Equipment Operator Labor	0.10	Rodent Bait-Wilco	0.25	Lb
Weed Control - Mow Middles 5X	Apr	75HP MFWD	Mower - Flail 10'	Equipment Operator Labor	0.28			
	May	75HP MFWD	Mower - Flail 10'	Equipment Operator Labor	0.28			
	June	75HP MFWD	Mower - Flail 10'	Equipment Operator Labor	0.28			
	July	75HP MFWD	Mower - Flail 10'	Equipment Operator Labor	0.28			
	Aug	75HP MFWD	Mower - Flail 10'	Equipment Operator Labor	0.28			
Irrigate	Apr			Non-Machine Labor	0.20	Water - Pump	7.20	acin
	May			Non-Machine Labor	0.20	Water - Pump	7.20	acin
	June			Non-Machine Labor	0.20	Water - Pump	7.20	acin
	July			Non-Machine Labor	0.20	Water - Pump	7.20	acin
	Aug			Non-Machine Labor	0.20	Water - Pump	7.20	acin
Disease-Bligh 3X (Kocide Manx)	Apr	75HP MFWD	Orch.Sprayer 500 G	Equipment Operator Labor	0.60	Kocide 3000	10.00	lb
						Manzate	7.26	pt
						2X		
	May	75HP MFWD	Orch.Sprayer 500 G	Equipment Operator Labor	0.30	Kocide 3000	5.00	lb
						Manzate	3.63	pt
Fertilizer - Nitrogen	May					UN-32	100.00	lb N
	Aug					UN-32	100.00	lb N
Vertebrate: Squirrel (Bait)	May		ATV	Equipment Operator Labor	0.05	Squirrel Bait-Wilco	0.15	lb
	June		ATV	Equipment Operator Labor	0.05	Squirrel Bait-Wilco	0.15	lb
	Sept		ATV	Equipment Operator Labor	0.05	Squirrel Bait-Wilco	0.15	lb
	Oct		ATV	Equipment Operator Labor	0.05	Squirrel Bait-Wilco	0.15	lb
Insect-Codling Moth (Lorsban)	May	75HP MFWD	Orch.Sprayer 500 G	Equipment Operator Labor	0.30	Lorsban 4E	4.00	pt
Insect: Mites (Omite)Misc Pests	June	75HP MFWD	Orch.Sprayer 500 G	Equipment Operator Labor	0.30	Omite 30W	5.00	lb
Insect-Codling Moth (Asana)	July	75HP MFWD	Orch.Sprayer 500 G	Equipment Operator Labor	0.30	Asana XL	4.00	floz
Prune: Summer (low branches)	July			Non-Machine Labor	2.00			
Prune: Brush Disposal Push burn	July	75HP MFWD	Loader Forks Brush Rake 9'	Non-Machine Labor	0.50			
Insect: Husk Fly (Malat NuLure	July	75HP MFWD	Orch.Sprayer 500 G	Equipment Operator Labor	0.30	Malathion 5EC	3.00	pt
						Nu Lure Bait	1.00	pt
Leaf Analysis	July		ATV	Non-Machine Labor		Leaf Analysis	0.04	each
Weed In-Season Spray (Rely)	Aug	65HP 2WD Trac	Weed Sprayer 100 G	Equipment Operator Labor	0.30	Rely 200	0.75	pt
Insect: Husk Fly (Asana NuLure	Aug	75HP MFWD	Orch.Sprayer 500 G	Equipment Operator Labor	0.30	Asana XL	4.00	floz
						Nu Lure Bait	1.00	pt
Growth Regulator (Ethephon)50%Ac	Aug	75HP MFWD	Orch.Sprayer 500 G	Equipment Operator Labor	0.20	Ethephon	2.50	pt
Weed-Dormant Strip, Goal Prow Rndup	Nov	65HP 2WD Trac	Weed Sprayer 100 G	Equipment Operator Labor	0.30	Goal 2XL	2.50	pt
						Prowl H20	3.13	pt
						Roundup Power Max	1.30	pt

UC COOPERATIVE EXTENSION

Table 8. Continued

Sacramento Valley 2012

Operation	Operation Month	Tractor	Implement	Labor Type	Labor Hours	Material	Rate/ acre	Unit
Pickup	Nov		Pickup 1/2 Ton	Equipment Operator Labor	1.20			
ATV Use	Nov		ATV	Equipment Operator Labor	2.40			
Miscellaneous Labor	Nov			Non-Machine Labor	3.00			
PCA Service	Nov					PCA Service	1.00	acre
Shake, Sweep, Pickup	Sept					Shake Sweep Pickup	1.00	acre
Hand Rake	Sept			Non-Machine Labor	1.50			
Haul to Dryer	Sept			Non-Machine Labor		Haul Nuts	2.70	ton
Hull, Dry	Sept					Dry/Hull Walnuts	5,400.00	lb
CWC Assessment Fee	Sept					CA Walnut Comm.	5,400.00	lb