

---

---

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2013

**SAMPLE COSTS TO ESTABLISH  
A WALNUT ORCHARD AND PRODUCE**

**WALNUTS**



**SAN JOAQUIN VALLEY - North**

Late leafing – lateral bearing

Joseph A. Grant

Janet L. Caprile

David A. Doll

Kathleen Kelly Anderson

Karen M. Klonsky

Richard L. De Moura

UC Cooperative Extension Farm Advisor, San Joaquin County

UC Cooperative Extension Farm Advisor, Contra Costa County

UC Cooperative Extension Farm Advisor, Merced County

UC Cooperative Extension Farm Advisor, Stanislaus County

UC Cooperative Extension Specialist, Department of Agricultural and Resource Economics, UC Davis

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

---

---

**UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION**

**SAMPLE COSTS TO  
ESTABLISH A WALNUT ORCHARD AND PRODUCE WALNUTS  
San Joaquin Valley North - 2013**

**STUDY CONTENTS**

INTRODUCTION ..... 2

ASSUMPTIONS..... 3

    Establishment Cultural Practices and Material Inputs ..... 3

    Mature Orchard Cultural Practices and Material Inputs ..... 5

    Labor, Equipment and Interest..... 7

    Cash Overhead ..... 8

    Non-Cash Overhead (Investments)..... 8

REFERENCES ..... 11

Table 1. Costs per Acre to Establish a Walnut Orchard ..... 12

Table 2. Costs per Acre to Produce Walnuts ..... 14

Table 3. Costs and Returns per Acre to Produce Walnuts ..... 15

Table 4. Monthly Cash Costs per Acre to Produce Walnuts ..... 17

Table 5. Ranging Analysis ..... 18

Table 6. Whole Farm Annual Equipment, Investment and Business Overhead..... 19

Table 7. Hourly Equipment Costs..... 19

Table 8. Operations with Equipment & Materials ..... 20

Acknowledgements: Information in this study was provided by UCCE farm advisors and specialists, pest control advisers, researchers, walnut growers and ag industry personnel.

**INTRODUCTION**

Sample costs to establish a walnut orchard and produce walnuts under sprinkler irrigation in the northern San Joaquin Valley are presented in this study. This study is intended as a guide only, and can be used in making production decisions, determining potential returns, preparing budgets and evaluating production loans. Practices described are based on those production practices considered typical for the crop and area, but 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 2 and 3 is provided to enter your 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.

Current and archived Sample Cost of Production Studies for several commodities can be downloaded from the Agricultural and Resource Economics website at UC Davis <http://coststudies.ucdavis.edu>, ordered by phone (530-752-6887) or obtained from your local UC Cooperative Extension office.

The University of California is an affirmative action/equal opportunity employer

## ASSUMPTIONS

The following assumptions refer to Tables 1 to 8 and pertain to sample costs to establish an orchard and produce walnuts under sprinkler irrigation in the northern San Joaquin Valley. The cultural practices described represent production operations and materials considered typical for a well managed farm in the region. Costs, materials, and practices in this study will not apply to all farms. Timing and types of cultural practices will vary among growers within the region and from season to season due to variables such as weather, soil, insect and disease pressure. The study is intended as a guide only. **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.** The hypothetical farm consists of 100 contiguous acres of land. Of that, 60 acres are being established to walnuts, 35 are planted to other permanent or annual crops, and five acres are roads, irrigation system and farmstead. The farm is managed by the owner.

### Establishment Cultural Practices and Material Inputs

(Table 1)

**Site Preparation.** The orchard is being established on land previously planted to walnuts. The land is assumed to be deep, well drained, and either a class I or II soil.

Orchard removal is done by an orchard removal company in November and field cleanup following tree removal is done by the grower. During November and December, the field is ripped in six passes in which the roots (and irrigation pipe from the former orchard) are removed by the grower. Ripping begins at a two foot depth and gets progressively deeper, ending at 3.5 to 4.5 feet. Some of the passes might be deferred to late spring (after grain/grass crop) if rains come early and/or the soil is too wet. A winter grain/grass crop is grown on the field during December to June. It is assumed that this will yield a zero net cost, therefore no cost is shown. The field is ripped to six feet deep in July, disked three times and landplaned in August. Berms are made in September and the field fumigated in September. All operations preparing the orchard for planting are done in the years prior to planting, but costs are shown in the first year.

**Trees.** The walnut trees are a late leafing, lateral bearing variety. The 3/4 inch caliber nursery grafted trees on Paradox rootstock are planted on 24 X 24 foot spacing, resulting in 76 trees per acre. The economic life of the orchard is estimated to be 25 years.

**Planting.** Planting in the late winter (February) starts by marking tree sites, then digging holes, and planting. This study assumes hand rather than machine planting. After or at planting, the trees are topped, the trunks are treated with white, water-based latex paint to protect the trees from sunburn and the trees are staked with ten-foot stakes. In the second year, 2% of the trees or an average of 1.5 trees per acre are replanted.

**Pruning.** New trees are topped at planting or soon thereafter. During the first spring and summer, the developing trunk is tied to the stake, competing scion shoots are tipped to favor growth of the trunk, and unwanted shoots growing from the rootstock are removed. These operations are done by the grower, and prunings are disposed of in orchard middles where they are disked. In the second year, prunings are disposed of in orchard middles where they are mowed by the grower. Beginning in the third year, brush disposal is done by a custom operator. Orchard prunings in the third year are stacked in every fourth row and then chipped or shredded, alternate middles in the fourth and fifth year, and all middles thereafter. Trees are pruned annually during the winter in years two through six by a custom operator to develop the permanent structural framework of the trees. Beginning in year 7, pruning is done in alternate years and one-half of the pruning costs are attributed to the operation each year.

**Irrigation.** Water is pumped from a well and passes through a filtration system to the full coverage sprinkler system using Nelson Rotator® R2000 sprinklers with buried PVC laterals. This study assumes that a well and pump existing from the former orchard required refurbishing to meet the water demands and pressure requirements of the new orchard. Refurbishing costs include inspection of the well, replacement of the motor and pump, upgrading of the electrical service, and installation of new filters. The orchard is irrigated from mid-April to mid-September. Price per acre-foot for water will vary among orchards in this region depending on the various well characteristics, irrigation district, and other factors. In this study, water is calculated to cost \$4.67 per acre-inch. The amount of water applied to the orchard during the establishment period is shown in Table A.

Year	Acre-Inches
1	20
2	20
3-5	36
6+	42

**Fertilization.** Nitrogen (N) is the major nutrient required for proper tree growth and optimum yields. During the first two years, 15-15-15 is applied by hand around the base of the young tree, once in March and once in June or July. Beginning in the third year, nitrogen fertilizer as UAN-32 is injected through the sprinkler system from April to late July/early August. Annual rates of actual N are shown in Table B.

Year	Lbs N
1	10
2	25
3	50
4	75
5	100
6	150
7+	200

*Tissue Testing.* Beginning in the third year, leaf samples at one sample per 20 acres are taken by the pest control adviser (PCA) in July for tissue analysis to determine nutrient status. The cost shown is for the lab analysis of samples.

**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.

*Fumigation.* Prior to removal of the previous orchard, the orchard site is sampled (1 sample/20 acres) and nematodes injurious to walnuts are found to be present, so the site is fumigated before planting. Preplant fumigation may not be necessary on bare or row crop ground, but is often necessary where orchards follow orchards. Telone II-C35, a soil fumigant, is applied down the tree rows (8.3 ft strip) at 46.7 gallons. A second pass (15 ft strip) is made down the aisles using Telone II at 33.7 gallons/acre. This will treat the entire orchard, 100% of the ground. Application costs including materials are approximately \$1,400 per acre. The above rates are effective on light textured soils when the soils are properly ripped and dried prior to fumigation. Heavier textured soils may need additional efforts to dry and prepare the soil if the fumigation is to be effective. Contact your local farm advisor or PCA for more information about fumigation.

*Weeds.* Beginning in the first year, a pre- and postemergent herbicide application is made under the tree rows (strip spray) in the fall (November) and again in spring (April). These treatments cover one-fourth of the orchard floor. Depending on weed pressure, an additional postemergent strip or ‘spot spray’ is made in August to control emerged weeds. Growers are encouraged to rotate herbicides with different modes of action to prevent resistance. Orchard middles are disced three times (April, May, August) during the first year and thereafter mowed five times (April, May, June, July, August).

*Insects and Diseases.* During the establishment years (1 through 7), pest and disease controls are minimal. Although many orchards are not treated for mites during the establishment years, mites are treated in this study beginning in July of the second and third year. Control of walnut blight disease begins in the third year with applications in April and May. In the fourth and subsequent years, a first seasonal treatment for

codling moth is applied in late June. A second spray for codling moth is made in mid-July. This spray consists of an insecticide that controls walnut husk fly (WHF) and walnut aphid, a bait for WHF, and a miticide. WHF control continues with three alternate row insecticide plus bait sprays in mid August through late September. All insect and disease sprays are applied by a custom applicator.

*Vertebrate pests.* Gophers are controlled with a burrow fumigant beginning in May and June of the third year. Ground squirrel burrows are fumigated in April and bait stations are maintained around the perimeter with ground squirrel bait from mid May thru June.

**Harvest.** Harvest starts in the fourth or fifth year depending on variety and tree growth. If the trees are not large enough at the first harvest to tolerate mechanical harvesting, they are hand harvested. Thereafter, harvest is performed mechanically, consisting of shaking, windrowing, picking up, and hauling of nuts to a hulling & dehydrating facility.

Yield Year	Yield (dry in-shell)	
	ton	lbs.
4	0.30	600
5	0.60	1,200
6	1.20	2,400
7	2.50	5,000
8+	3.00	6,000

**Yields and Returns.** Yields are shown in Table C. See Harvest in the Mature Orchard section for more information on returns.

### **Mature Orchard Cultural Practices and Material Inputs** (Tables 2 - 8)

This section outlines the cultural practices used in this study for the production of walnuts once the orchard is mature. These will vary among growers and regions. For additional information contact the farm advisor in the county of interest.

**Pruning.** Pruning methods will vary depending on variety, rootstock, and planting density as determined by row spacing. In this study, pruning is done “by hand” in alternate years during the dormant period (January/February) by a custom operator using mechanical towers. Prunings are placed in the row middles and chipped or shredded by a custom operator. One-half of the cost of the pruning, stacking and shredding is charged to the operation each year.

**Irrigation.** Irrigation costs include pumping and labor costs. The water is pumped from a well and passes through a filtration system and fed into the full coverage sprinkler system. Forty-two acre inches of water are applied from mid April to mid September. Although not shown in this study, a postharvest irrigation may be needed from late September through October. Irrigations will vary according to tree size and soil type. A water pumping cost of \$4.67 per acre inch is based on current PG&E rates. Tensiometers, water budgeting using evapotranspiration estimates, stem water potential measurements, or other established methods are used to monitor orchard water status and schedule irrigations. The monitoring may be done by the grower or by a private irrigation consultant. This study assumes monitoring is done by the grower at no additional cost. Labor is calculated at 0.06 hours per irrigation and includes time for routine maintenance, which includes repairing broken sprinklers and line maintenance.

**Fertilization.** Beginning with the first irrigation, a total of 200 pounds of nitrogen per season as UAN32 is injected through the sprinklers from April to late July/early August. Labor costs for fertilizer application are included in the irrigation costs. Fertilizer rates should be adjusted according to need as indicated by leaf analysis results.

*Tissue Testing.* Leaf samples are taken in July by the PCA at one sample per 20 acres for tissue analysis to determine nutrient status. The cost shown is for the lab analysis.

**Pest Management.** The pesticides and rates mentioned in this cost study are listed in *UC Integrated Pest Management Guidelines, Walnuts*. For more information on other pesticides available, organic options, pest identification, monitoring, and management, visit the UC IPM website at <http://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 grower volume. Pesticide costs in this study are taken from a single dealer and shown as full retail.

*Pest Control Adviser.* The PCA or crop consultant monitors the field for agronomic problems including pests and nutrition and writes pesticide recommendations. Growers may hire private PCAs or receive the service as part of a service agreement with an agricultural chemical and fertilizer company. The PCA service in this study is provided by the chemical/fertilizer company that supplies the grower.

*Weeds.* Weeds are controlled in the tree row with a pre- plus post-emergent strip spray in the fall (November-December) and again in the spring (April). A post-emergent material is applied in August as a spot spray to control emerging weeds that were not controlled by the previous sprays. The middles are mowed five times, once per month from April to August. Mowing the vegetation in the row middles in April also provides frost protection.

*Insects.* Several insect pests are treated each year. Insect and disease applications are done by a custom operator. Multiple generations of codling moth occur and are controlled with carefully timed sprays based on developmental models and population monitoring. A first seasonal treatment for codling moth is applied in late June. A second spray for codling moth is made in mid-July. This spray consists of an insecticide that also controls walnut husk fly (WHF) and walnut aphid, a bait for WHF, and a miticide. WHF control continues with three alternate row insecticide plus bait sprays in mid August through late September.

*Disease.* Two spray applications are made in April and May to control walnut blight disease.

*Vertebrate pests.* Gophers are controlled with a burrow fumigant in May and June. Ground squirrel burrows are fumigated in April and bait stations are maintained around the perimeter with ground squirrel bait from mid May thru June.

**Harvest.** In this cost study, the crop is harvested (shaken, windrowed, raked, and picked up) and hauled by a contracted custom harvesting operation. The study assumes that the orchard is harvested once. The grower pays the hulling and dehydrating costs. Mechanical harvesting begins by shaking the tree trunk or branches to remove the walnuts. Sweepers windrow the walnuts in the orchard middles so that the pick-up machine can gather and dump them into trailers. Hand labor for raking nuts from around the trees missed by the sweeper is included in the custom harvest. The walnuts are hauled from the orchard to a hulling and dehydrating facility.

**Yields.** Typical annual yields for English varieties are measured in clean, dry, in-shell tons or pounds per acre and are shown in Table C. The average yield over the life of the orchard in this study is 6,000 pounds.

**Returns.** Actual price depends on a number of factors such as demand, crop size, variety, nut size, and quality. An estimated price of \$1.20 per dehydrated in-shell pound is used in this study so that a ranging analysis for different yields and prices can be calculated.

**Assessments.** Under state law, the California Walnut Commission (CWC) collects mandatory assessment fees from growers to pay for walnut related activities. The CWC assessment for the 2012/2013 crop year is \$0.01 per pound of in-shell nuts

**Pickup/ATV-Mule.** The study assumes pickup business use mileage of two hours per acre per year for the farm. The ATV-Mule use for checking the orchard, diseases and irrigation system are shown as a line item. The travel and time for the pickup and ATV-Mule are estimated and not taken from any specific data.

### **Labor, Equipment and Interest**

**Labor.** Hourly wages for workers are \$11.00 for machine operators and \$8.00 per hour non-machine labor. Adding 36% for the employer's share of federal and state payroll taxes, workers compensation insurance for nut crops (0045) and other possible benefits gives the labor rates shown of \$14.96 and \$10.88 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, 2012 (personal email from California Department of Insurance, May 2012, unreferenced). 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 and Biological Engineers (ASABE). Fuel and lubrication costs are also determined by ASABE equations based on maximum power takeoff (PTO) horsepower, and fuel type. Prices for on-farm delivery of diesel and gasoline are \$3.43 and \$3.82 per gallon, respectively. Fuel costs are derived from Energy Information Administration 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 costs per acre for each operation in Table 2 are 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 2013.

**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.

**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. Salvage value for investments will vary.

**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 0.803% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$608 for the entire farm.

**Office Expense.** Office and business expenses are estimated at \$75 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, shop and office utilities, and miscellaneous administrative charges. Office expenses are estimated and not taken from any collected data.

**Regulatory Costs.** Various environmental fees are collected by the county and state. The fees will vary by county. For example the Air Resources Board (state agency) charges \$100 per plan to deal with air pollution and the Ag Waiver Fee (county agency) cost \$2.00 per acre. The grower must also provide safety training, safety equipment, and maintain training records. For this study, a cost of \$5.26 per producing acre or \$500 for the farm is assumed.

**Sanitation Services.** Sanitation services provide portable single toilet units with washing facilities for the orchard and cost the farm (orchard) \$306 annually. The cost includes delivery and two months of weekly service.

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

**Investment Repairs.** Annual maintenance/repairs on investments (Non-cash Overhead) is calculated as two percent of the purchase price, except for tree replacement in the orchard. The average tree replacement cost over the life of the orchard is assumed to be 0.10% of the establishment cost.

## 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 and Biological Engineers (ASABE) based on equipment type and years of life. The life in years is estimated by dividing the wearout life, as given by ASABE 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 2013.

**Land Value.** Bare crop land for walnut production is estimated to cost \$14,000 per acre or \$14,736 per producing acre. Values will vary according to soil type and water source. Values for land with established walnut orchards in the northern San Joaquin Valley ranges from \$15,000 to \$25,000 per acre (2012 Trends & Leases).

**Sprinkler Irrigation System.** The sprinkler system is a full coverage system using Nelson Rotator<sup>®</sup> R2000 sprinklers with buried PVC laterals. The system is installed in the tree row on the 60 walnut acres and includes a filtration/injection system located near the pumping plant.

**Irrigation Pumping System.** The 200 foot deep well with a pumping level at 125 – 150 feet on the site and a 125 horsepower pump to irrigate the 60 acres was refurbished at a cost of \$70,000 (from local well/pump company). Refurbishing costs include inspection of the well, replacement of the motor and pump, upgrading of the electrical service, and installation of new filters.

**Fuel Tanks.** Two 500-gallon fuel tanks are placed on stands in cement containment meeting Federal, State, and local regulations. Fuel is delivered to the equipment by gravity feed.

**Tools.** Includes shop tools/equipment, hand tools and field tools such as pruning equipment.

**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 walnut trees through the first year nuts are harvested less returns from production. The *Accumulated Net Cash Cost* in the fourth year shown in Table 1 represents the establishment cost per acre. For this study, this cost is \$8,919 per acre or \$535,140 for the 60-acre orchard. Establishment cost is amortized beginning in the fifth year over the remaining 21 years of production. Tree replacement or repairs is 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

- Ag Commissioner. 2012. Annual Crop Reports. Merced County, San Joaquin County, and Stanislaus County.
- American Society of Agricultural and Biological Engineers. (ASABE). 1994. *American Society of Agricultural and Biological 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. 2012. *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 January 2013. <http://www.boe.ca.gov/sptaxprog/spftdrates.htm>
- Energy Information Administration. 2012. *Weekly Retail on Highway Diesel and Gasoline Prices*. Internet accessed January 2013. <http://www.eia.gov/petroleum/gasdiesel/>
- Doanes Editors. *Facts and Figures for Farmers*. 1977. Doane Publishing, St. Louis, MO. P 292.
- University of California Statewide Integrated Pest Management Program. *UC Pest Management Guidelines, Walnuts*. 2011. University of California, Davis, CA. <http://www.ipm.ucdavis.edu>
- Grant, Joseph A., Kathleen M. Kelly-Anderson, Janet L. Caprile, Karen M. Klonsky and Richard L. De Moura. 2007. *Sample Costs to Establish a Walnut Orchard and Produce Walnuts. Northern San Joaquin Valley*. University of California Cooperative Extension, Department of Agricultural and Resource Economics. Davis, CA.
- University of California. 1987. *Integrated Pest Management for Walnuts*. 2nd ed. Pub. 3270. University of California, Division of Agriculture and Natural Resources. Oakland, CA.
- University of California. 1998. *Walnut Production Manual*. Pub. 3373. University of California, Division of Agriculture and Natural Resources. Oakland, CA.
-

UC COOPERATIVE EXTENSION  
San Joaquin Valley - North 2013

**Table 1. SAMPLE COSTS PER ACRE TO ESTABLISH A WALNUT ORCHARD**

	Cost Per Acre							
	Year:	1st	2nd	3rd	4th	5th	6th	7th
Yield: Pounds Per Acre:					600	1,200	2,400	5,000
<b>Planting Costs:</b>								
Land Prep: Orchard Removal		150						
Fumigation: Nematode Sample (1/20 acres)		2						
Land Prep: Subsoil 6X (field cleanup, root & pipe removal)		1,200						
Land Prep: Level/seed bed preparation for cover crop		70						
Land Prep: Dec - June (grain/grass grows) (no costs shown)								
Land Prep: Subsoil/Rip to 6 ft. depth		300						
Land Prep: Disc 3X & landplane		100						
Land Prep: Make Berms		30						
Fumigation: Tree rows & middles (Telone)		1,400						
Plant: Survey, Mark, Dig Holes & Plant (includes 76 trees)		1,383	27					
Plant: Stake & Paint Trees (includes stakes)		212	3					
<b>TOTAL PLANTING COSTS</b>		<b>4,847</b>	<b>30</b>					
<b>Cultural Costs:</b>								
Prune/Sucker: (Yr 1, prune & sucker. Yrs 2+, prune.) (Yrs 7+, alternate years)		100	20	40	125	200	250	150
Fertilize: Hand applied (15-15-15) Yr 1-2. Injected through sprinklers (UAN) Yr 3+		48	87	42	63	84	126	168
Irrigate: (energy & labor) (fertigation labor included)		106	106	181	181	181	209	209
Weed: Spring strip spray (Prowl, Gramoxone) Yr 1-2. (Prowl, Roundup) Yr 3+		22	22	21	21	21	21	21
Weed: Disc 3X (Yr 1) Mow 5X (Yr 2+)		18	41	41	41	41	41	41
Weed: Summer spot spray (Rely)		11	11	11	11	11	11	11
Weed: Fall strip spray (Matrix, Gramoxone) Yr 1-2. (Chateau, Roundup) Yr 3+		30	29	22	22	22	22	22
Insect: Mites (Zeal)			121	121				
Vertebrate: Ground squirrels (Weevil-Cide in burrows)				3	3	3	3	3
Vertebrate: Ground squirrels (bait & stations)				19	19	19	19	19
Vertebrate: Gophers (Weevil-Cide)				9	9	9	9	9
Disease: Walnut blight (Badge, Manzate)				137	137	137	137	137
Fertilize: Leaf samples/Tissue analysis				3	3	3	3	3
Prune: Stack & shred prunings (4th middle) Yr 3. (alternate) Yr 4-5. (all middles) Yr 6+.				30	60	60	90	90
Insect: Codling moth (Belt, Warrior)					73	73	73	73
Insect: Codling moth, walnut husk fly, aphid, mite (Lorsban, NuLure, Onager)					143	143	143	143
Insect: Walnut husk fly (Assail, NuLure bait) (alternate rows)					59	59	59	59
Insect: Walnut husk fly (NuLure, Fanfare) 2X (alternate rows)					69	69	69	69
ATV use		20	20	20	20	20	20	20
Pickup use		60	60	60	60	60	60	60
<b>TOTAL CULTURAL COSTS</b>		<b>416</b>	<b>518</b>	<b>760</b>	<b>1,119</b>	<b>1,215</b>	<b>1,365</b>	<b>1,307</b>
<b>Harvest Costs:</b>								
Shake, pick, sweep, haul					45	90	180	350
Dry and Hull					42	84	168	350
California Walnut Commission Assessment					6	12	24	50
<b>TOTAL HARVEST COSTS</b>					<b>93</b>	<b>186</b>	<b>372</b>	<b>750</b>
Interest On Operating Capital @ 5.75%		395	15	23	23	27	32	31
<b>TOTAL OPERATING COSTS/ACRE</b>		<b>5,657</b>	<b>563</b>	<b>783</b>	<b>1,235</b>	<b>1,428</b>	<b>1,769</b>	<b>2,088</b>

UC COOPERATIVE EXTENSION  
San Joaquin Valley - North 2013  
**Table 1. CONTINUED**

	Cost Per Acre									
	Year:	1st	2nd	3rd	4th	5th	6th	7th		
Yield: Pounds Per Acre:							600	1,200	2,400	5,000
Cash Overhead Costs:										
Office Expense		75	75	75	75	75	75	75	75	
Liability Insurance		6	6	6	6	6	6	6	6	
Sanitation Service		5	5	5	5	5	5	5	5	
Regulatory Fees		5	5	5	5	5	5	5	5	
Property Taxes		167	169	169	169	169	169	169	169	
Property Insurance		16	17	18	18	18	18	18	18	
Investment Repairs		73	73	73	73	73	73	73	73	
<b>TOTAL CASH OVERHEAD COSTS</b>		<b>347</b>	<b>351</b>	<b>352</b>	<b>352</b>	<b>352</b>	<b>352</b>	<b>352</b>	<b>352</b>	
<b>TOTAL CASH COSTS/ACRE</b>		<b>6,004</b>	<b>914</b>	<b>1,135</b>	<b>1,587</b>	<b>1,780</b>	<b>2,121</b>	<b>2,440</b>	<b>2,440</b>	
<b>INCOME/ACRE FROM PRODUCTION</b>					<b>720</b>	<b>1,440</b>	<b>2,880</b>	<b>6,000</b>	<b>6,000</b>	
<b>NET CASH COSTS/ACRE FOR THE YEAR</b>		<b>6,004</b>	<b>914</b>	<b>1,135</b>	<b>867</b>	<b>340</b>				
<b>PROFIT/ACRE ABOVE CASH COSTS</b>							<b>759</b>	<b>3,560</b>		
<b>ACCUMULATED NET CASH COSTS/ACRE</b>		<b>6,004</b>	<b>6,918</b>	<b>8,052</b>	<b>8,919</b>	<b>9,259</b>	<b>8,500</b>	<b>4,939</b>		
Non-Cash Overhead Costs (Capital Recovery)										
Buildings (2400 sqft)		53	53	53	53	53	53	53	53	
Fuel Tanks		6	6	6	6	6	6	6	6	
Irrigation System		88	88	88	88	88	88	88	88	
Pump/Well		74	74	74	74	74	74	74	74	
Land		700	700	700	700	700	700	700	700	
Shop/Field Tools		14	14	14	14	14	14	14	14	
Bait Traps				5	5	5	5	5	5	
Equipment		35	89	94	89	89	89	89	89	
<b>TOTAL CAPITAL RECOVERY</b>		<b>971</b>	<b>1,025</b>	<b>1,034</b>	<b>1,029</b>	<b>1,029</b>	<b>1,029</b>	<b>1,029</b>	<b>1,029</b>	
<b>TOTAL COST/ACRE FOR THE YEAR</b>		<b>6,975</b>	<b>1,939</b>	<b>2,169</b>	<b>2,616</b>	<b>2,809</b>	<b>3,151</b>	<b>3,469</b>		
<b>INCOME/ACRE FROM PRODUCTION</b>					<b>720</b>	<b>1,440</b>	<b>2,880</b>	<b>6,000</b>		
<b>TOTAL NET COST/ACRE FOR THE YEAR</b>		<b>6,975</b>	<b>1,939</b>	<b>2,169</b>	<b>1,896</b>	<b>1,369</b>	<b>271</b>			
<b>NET PROFIT/ACRE ABOVE TOTAL COST</b>								<b>2,531</b>		
<b>TOTAL ACCUMULATED NET COST/ACRE</b>		<b>6,975</b>	<b>8,913</b>	<b>11,082</b>	<b>12,978</b>	<b>14,347</b>	<b>14,618</b>	<b>12,087</b>		

UC COOPERATIVE EXTENSION  
San Joaquin Valley - North 2013  
**Table 2. COSTS PER ACRE TO PRODUCE WALNUTS**

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per Acre					Total Cost	Your Cost
		Labor Cost	Fuel	Lube & Repairs	Material Cost	Custom/ Rent		
<b>Cultural:</b>								
Prune: (contract) Alt Yrs (1/2 cost shown)	0.00	0	0	0	0	150	150	
Prune: (contract) Stack & shred, Alt Yrs (1/2 cost shown)	0.00	0	0	0	0	90	90	
Irrigate 10X (water, labor & fertilizer labor)	1.20	13	0	0	196	0	209	
Vertebrate: Ground squirrel burrows (Weevil-Cide)	0.17	2	0	0	1	0	3	
Fertilize: N (UAN32). Injected through sprinklers	0.00	0	0	0	168	0	168	
Weed: Spring strip spray (Prowl, Roundup)	0.18	3	0	0	17	0	21	
Weed: Mow 5X	0.92	17	15	9	0	0	41	
Disease: Blight 2X (Badge, Manzate)	0.00	0	0	0	87	50	137	
Vertebrate: Gopher (Weevil-Cide)	0.25	3	0	0	2	0	4	
Vertebrate: Ground squirrel (bait stations)	0.30	3	0	0	16	0	19	
Insect: Codling moth (Belt, Warrior)	0.00	0	0	0	48	25	73	
Fertilizer: Leaf sampling	0.00	0	0	0	0	3	3	
Insect: Codling moth, husk fly, mite, aphid ( Lorsban, NuLure, Onager)	0.00	0	0	0	118	25	143	
Insect: Husk fly (NuLure, Assail) Alt row	0.00	0	0	0	47	13	59	
Weed: Summer spot spray (Rely)	0.18	3	0	0	7	0	11	
Insect: Husk fly (Fanfare, NuLure) Alt row	0.00	0	0	0	44	25	69	
Weed: Fall strip spray (Chateau, Roundup)	0.18	3	0	0	19	0	22	
Pickup Truck Use	2.00	36	17	7	0	0	60	
ATV Use	1.00	18	1	1	0	0	20	
<b>TOTAL Cultural COSTS</b>	<b>6.38</b>	<b>101</b>	<b>35</b>	<b>18</b>	<b>769</b>	<b>380</b>	<b>1,303</b>	
<b>Harvest:</b>								
Harvest: Shake, sweep, pickup, haul	0.00	0	0	0	0	420	420	
Hull & Dry	0.00	0	0	0	0	420	420	
CA Walnut Commission assessment	0.00	0	0	0	60	0	60	
<b>TOTAL Harvest COSTS</b>	<b>0.00</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>60</b>	<b>840</b>	<b>900</b>	
Interest on Operating Capital @ 5.75%							32	
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>6.38</b>	<b>101</b>	<b>35</b>	<b>18</b>	<b>829</b>	<b>1,220</b>	<b>2,235</b>	
<b>CASH OVERHEAD:</b>								
Liability Insurance							6	
Office Expense							75	
Regulatory Fees							5	
Sanitation Service							5	
Property Taxes							211	
Property Insurance							51	
Investment Repairs							82	
<b>TOTAL CASH OVERHEAD COSTS/ACRE</b>							<b>436</b>	
<b>TOTAL CASH COSTS/ACRE</b>							<b>2,671</b>	
<b>NON-CASH OVERHEAD:</b>								
		Per producing Acre		Annual Cost Capital Recovery				
Buildings 2400 sqft		842		53			53	
Fuel Tanks 2-500ga		69		6			6	
Irrigation system		1,400		88			88	
Land		14,737		700			700	
Orchard Establishment		8,919		680			680	
Pump/Well		1,167		74			74	
Shop/Field Tools		158		14			14	
Equipment		232		29			29	
<b>TOTAL NON-CASH OVERHEAD COSTS</b>		<b>27,523</b>		<b>1,645</b>			<b>1,645</b>	
<b>TOTAL COSTS/ACRE</b>							<b>4,316</b>	

UC COOPERATIVE EXTENSION  
San Joaquin Valley - North 2013

**Table 3. COSTS AND RETURNS PER ACRE TO PRODUCE WALNUTS**

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Costs
<b>GROSS RETURNS</b>					
Walnuts	6,000.00	lb	1.20	7,200	
<b>TOTAL GROSS RETURNS</b>	<b>6,000.00</b>	<b>lb</b>		<b>7,200</b>	
<b>OPERATING COSTS</b>					
<b>Herbicide:</b>					<b>42</b>
Prowl H2O	0.25	gal	61.00	15	
Roundup Ultra Max	16.00	fl oz	0.20	3	
Rely 280	8.00	fl oz	0.86	7	
Chateau SW	2.00	oz	8.49	17	
<b>Fungicide:</b>					<b>87</b>
Badge X2	8.00	lb	6.98	56	
Manzate Pro Stick	4.80	lb	6.45	31	
<b>Insecticide:</b>					<b>257</b>
Belt	4.00	fl oz	9.40	38	
Warrior II	2.00	oz	5.25	11	
Lorsban Advanced	4.00	pt	8.65	35	
Nu-Lure Bait	12.00	pt	4.02	48	
Onager	20.00	oz	3.58	72	
Assail 30 SP	4.00	oz	8.64	35	
Fanfare 2EC	10.00	fl oz	2.00	20	
<b>Rodenticide:</b>					<b>19</b>
Weevil-Cide (tablets)	36.00	each	0.08	3	
Ground Squirrel Bait	10.80	lb	1.50	16	
<b>Custom/Contract:</b>					<b>1,220</b>
Prune (alternate years, 1/2 cost)	1.00	acre	150.00	150	
Stack & shred prunings (alternate years, 1/2 cost)	1.00	acre	90.00	90	
Spray, Ground - Air blast sprayer	5.50	acre	25.00	138	
Leaf analysis	0.05	each	50.00	3	
Shake sweep, pickup, haul	6,000.00	lb	0.07	420	
Dry/Hull	6,000.00	lb	0.07	420	
<b>Irrigation:</b>					<b>196</b>
Water - Pump	42.00	acin	4.67	196	
<b>Fertilizer:</b>					<b>168</b>
UAN32 (32-0-0)	200.00	lb N	0.84	168	
<b>Assessment:</b>					<b>60</b>
CA Walnut Commission	6,000.00	lb	0.01	60	
<b>Labor:</b>					<b>101</b>
Equipment Operator Labor	5.36	hrs	14.96	80	
Non-Machine Labor	1.92	hrs	10.88	21	
<b>Machinery:</b>					<b>53</b>
Fuel-Gas	0.58	gal	3.82	2	
Fuel-Diesel	9.48	gal	3.43	33	
Lube				5	
Machinery Repair				13	
Interest on Operating Capital @ 5.75%				32	
<b>TOTAL OPERATING COSTS/ACRE</b>				<b>2,235</b>	
<b>NET RETURNS ABOVE OPERATING COSTS</b>				<b>4,965.09</b>	

UC COOPERATIVE EXTENSION  
 San Joaquin Valley - North 2013

**Table 3. CONTINUED**

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Costs
<b>CASH OVERHEAD COSTS</b>					
Liability Insurance				6	
Office Expense				75	
Regulatory Fees				5	
Sanitation Service				5	
Property Taxes				211	
Property Insurance				51	
Investment Repairs				82	
<b>TOTAL CASH OVERHEAD COSTS/ACRE</b>				<b>436</b>	
<b>TOTAL CASH COSTS/ACRE</b>				<b>2,671</b>	
<b>NON-CASH OVERHEAD COSTS (Capital Recovery)</b>					
Buildings 2400 sqft				53	
Fuel Tanks 2-500 gal				6	
Irrigation system				88	
Land				700	
Orchard Establishment				680	
Pump/Well				74	
Shop/Field Tools				14	
Equipment				29	
<b>TOTAL NON-CASH OVERHEAD COSTS</b>				<b>1,645</b>	
<b>TOTAL COST/ACRE</b>				<b>4,316</b>	
<b>NET RETURNS ABOVE TOTAL COST</b>				<b>2,884</b>	



UC COOPERATIVE EXTENSION  
San Joaquin Valley - North 2013

**Table 4. MONTHLY CASH COSTS PER ACRE TO PRODUCE WALNUTS**

Beginning 01-13	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Ending 11-13	13	13	13	13	13	13	13	13	13	13	13	13	13
<b>Cultural:</b>													
Prune: (contract) Alt Yrs (1/2 cost shown)	150												150
Prune: (contract) Stack & shred, Alt Yrs (1/2 cost shown)		90											90
Irrigate 10X (water, labor & fertilizer labor)				21	42	42	42	42	21				209
Vertebrate: Ground squirrel burrows (Weevil-Cide)				3									3
Fertilize: N (UAN32). Injected through sprinklers				34	34	34	34	34					168
Weed: Spring strip spray (Prowl, Roundup)				21									21
Weed: Mow 5X				8	8	8	8	8					41
Disease: Blight 2X (Badge, Manzate)				68	68								137
Vertebrate: Gopher (Weevil-Cide)					4								4
Vertebrate: Ground squirrel (bait stations)					6	13							19
Insect: Codling moth (Belt, Warrior)								73					73
Fertilizer: Leaf sampling								3					3
Insect: Codling moth, husk fly, mite, aphid ( Lorsban, NuLure, Onager)								143					143
Insect: Husk fly (NuLure, Assail) Alt row									59				59
Weed: Summer spot spray (Rely)									11				11
Insect: Husk fly (Fanfare, NuLure) Alt row										69			69
Weed: Fall strip spray (Chateau, Roundup)											22		22
Pickup Truck Use	5	5	5	5	5	5	5	5	5	5	5	5	60
ATV Use	2	2	2	2	2	2	2	2	2	2	2	2	20
<b>TOTAL Cultural COSTS</b>	<b>157</b>	<b>97</b>	<b>7</b>	<b>162</b>	<b>170</b>	<b>103</b>	<b>309</b>	<b>160</b>	<b>97</b>	<b>7</b>	<b>29</b>	<b>7</b>	<b>1,303</b>
<b>Harvest:</b>													
Harvest: Shake, sweep, pickup, haul									420				420
Hull & Dry									420				420
CA Walnut Commission assessment									60				60
<b>TOTAL Harvest COSTS</b>									<b>900</b>				<b>900</b>
Interest on Operating Capital @ 5.75%	1	1	1	2	3	3	5	6	10	0	0	0	32
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>157</b>	<b>98</b>	<b>8</b>	<b>164</b>	<b>172</b>	<b>106</b>	<b>314</b>	<b>166</b>	<b>1,007</b>	<b>6</b>	<b>29</b>	<b>7</b>	<b>2,235</b>
<b>CASH OVERHEAD</b>													
Liability Insurance			6										6
Office Expense	7	7	7	7	7	7	7	7	7	7	7	7	75
Regulatory Fees			5										5
Sanitation Service	0	0	0	0	0	0	0	0	0	0	0	0	5
Property Taxes	106						106						211
Property Insurance	26						26						51
Investment Repairs	7	7	7	7	7	7	7	7	7	7	7	7	82
<b>TOTAL CASH OVERHEAD COSTS</b>	<b>145</b>	<b>14</b>	<b>26</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>145</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>7</b>	<b>436</b>
<b>TOTAL CASH COSTS/ACRE</b>	<b>303</b>	<b>112</b>	<b>33</b>	<b>178</b>	<b>186</b>	<b>121</b>	<b>459</b>	<b>180</b>	<b>1,021</b>	<b>21</b>	<b>43</b>	<b>13</b>	<b>2,671</b>

UC COOPERATIVE EXTENSION  
 San Joaquin Valley - North 2013  
**Table 5. RANGING ANALYSIS**

COST PER ACRE AT VARYING YIELDS TO PRODUCE WALNUTS

	YIELD (lb/acre)						
	3,000	4,000	5,000	6,000	7,000	8,000	9,000
<b>OPERATING COSTS:</b>							
Cultural	1,303	1,303	1,303	1,303	1,303	1,303	1,303
Harvest	450	600	750	900	1,050	1,200	1,350
Interest on operating capital @ 5.75%	30	30	31	32	33	33	34
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>1,783</b>	<b>1,933</b>	<b>2,084</b>	<b>2,235</b>	<b>2,386</b>	<b>2,536</b>	<b>2,687</b>
Total Operating Costs/lb	0.59	0.48	0.42	0.37	0.34	0.32	0.30
<b>CASH OVERHEAD COSTS/ACRE</b>							
<b>TOTAL CASH COSTS/ACRE</b>	<b>2,219</b>	<b>2,369</b>	<b>2,520</b>	<b>2,671</b>	<b>2,822</b>	<b>2,972</b>	<b>3,123</b>
Total Cash Costs/lb	0.74	0.59	0.50	0.45	0.40	0.37	0.35
<b>NON-CASH OVERHEAD COSTS/ACRE</b>							
<b>TOTAL COSTS/ACRE</b>	<b>3,864</b>	<b>4,015</b>	<b>4,165</b>	<b>4,316</b>	<b>4,467</b>	<b>4,617</b>	<b>4,768</b>
Total Costs/lb	1.29	1.00	0.83	0.72	0.64	0.58	0.53

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE(\$/lb) Production	YIELD (lb/acre)						
	3,000	4,000	5,000	6,000	7,000	8,000	9,000
0.80	617	1,267	1,916	2,565	3,214	3,864	4,513
0.90	917	1,667	2,416	3,165	3,914	4,664	5,413
1.00	1,217	2,067	2,916	3,765	4,614	5,464	6,313
1.10	1,517	2,467	3,416	4,365	5,314	6,264	7,213
1.20	1,817	2,867	3,916	4,965	6,014	7,064	8,113
1.30	2,117	3,267	4,416	5,565	6,714	7,864	9,013
1.40	2,417	3,667	4,916	6,165	7,414	8,664	9,913
1.50	2,717	4,067	5,416	6,765	8,114	9,464	10,813
1.60	3,017	4,467	5,916	7,365	8,814	10,264	11,713

NET RETURNS PER ACRE ABOVE CASH COSTS

PRICE(\$/lb) Production	YIELD (lb/acre)						
	3,000	4,000	5,000	6,000	7,000	8,000	9,000
0.80	181	831	1,480	2,129	2,778	3,428	4,077
0.90	481	1,231	1,980	2,729	3,478	4,228	4,977
1.00	781	1,631	2,480	3,329	4,178	5,028	5,877
1.10	1,081	2,031	2,980	3,929	4,878	5,828	6,777
1.20	1,381	2,431	3,480	4,529	5,578	6,628	7,677
1.30	1,681	2,831	3,980	5,129	6,278	7,428	8,577
1.40	1,981	3,231	4,480	5,729	6,978	8,228	9,477
1.50	2,281	3,631	4,980	6,329	7,678	9,028	10,377
1.60	2,581	4,031	5,480	6,929	8,378	9,828	11,277

NET RETURNS PER ACRE ABOVE TOTAL COSTS

PRICE(\$/lb) Production	YIELD (lb/acre)						
	3,000	4,000	5,000	6,000	7,000	8,000	9,000
0.80	-1,464	-815	-165	484	1,133	1,783	2,432
0.90	-1,164	-415	335	1,084	1,833	2,583	3,332
1.00	-864	-15	835	1,684	2,533	3,383	4,232
1.10	-564	385	1,335	2,284	3,233	4,183	5,132
1.20	-264	785	1,835	2,884	3,933	4,983	6,032
1.30	36	1,185	2,335	3,484	4,633	5,783	6,932
1.40	336	1,585	2,835	4,084	5,333	6,583	7,832
1.50	636	1,985	3,335	4,684	6,033	7,383	8,732
1.60	936	2,385	3,835	5,284	6,733	8,183	9,632

UC COOPERATIVE EXTENSION  
SAN JOAQUIN VALLEY - NORTH 2013

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

ANNUAL EQUIPMENT COSTS

Yr	Description	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insur- ance	Taxes		
13	90HP 4WD Tractor	15	10,790	4,740	266	331		5,337
13	All Terrain Vehicle (ATV-Mule)	12	2,250	858	45	56		959
13	Mower-Flail 10'	10	2,122	1,365	57	71		1,492
13	Pickup 1/2 ton	5	12,549	4,140	163	203		4,506
13	Weed Sprayer 100 Gal	10	884	569	24	29		622
TOTAL			28,595	11,671	554	690		12,916
60% of New Cost *			17,157	7,003	332	414		7,749

\*Used to reflect a mix of new and used equipment

INVESTMENTS

Description	Price	Yrs	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insur- ance	Taxes	Repairs	
INVESTMENT								
Buildings 2400 sqft	80,000	30	0	5,057	321	400	1,600	7,378
Fuel Tanks 2 - 250 gal	6,514	15	651	586	29	36	130	781
Irrigation: Full coverage sprinklers (60 ac)	84,000	30	0	5,310	337	420	1,680	7,747
Land (100 ac)	1,400,000	30	1,400,000	66,500	0	14,000	0	80,500
Orchard Establishment	535,140	21	0	40,825	2,149	2,676	535	46,185
Pump/Well for 60 acres	70,000	30	0	4,425	281	350	1,400	6,456
Shop/Field Tools	15,000	15	1,500	1,350	66	83	300	1,799
TOTAL INVESTMENT	2,190,654		1,402,151	124,053	3,183	17,964	5,645	150,845

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	95	acre	6.40	608
Office Expense	95	acre	75.00	7,125
Regulatory Fees	95	acre	5.26	500
Sanitation Service (60 acres)	60	acre	5.10	306

UC COOPERATIVE EXTENSION  
San Joaquin Valley - North 2013  
**Table 7. HOURLY EQUIPMENT COSTS**

Yr	Description	Walnut Hours Used	Total Hours Used	COSTS PER HOUR							Total Costs/Hr.
				Capital Recovery	Cash Overhead		Operating			Total Oper.	
					Insur- ance	Taxes	Repairs	Fuel & Lube			
13	Pickup 1/2 ton	120	280	8.87	0.35	0.43	4.27	8.58	12.85	22.50	
13	Weed Sprayer 100 Gal	33	153	2.24	0.09	0.12	1.32	0.00	1.32	3.77	
13	90 HP 4WD Tractor	61	1,066	2.67	0.15	0.19	3.69	15.16	18.85	21.86	
13	Mower Flail 10'	55	200	4.09	0.17	0.21	5.85	0.00	5.85	10.32	
13	ATV-Mule	93	226	2.28	0.12	0.15	0.69	1.43	2.12	4.67	

UC COOPERATIVE EXTENSION  
San Joaquin Valley - North 2013  
**Table 8. OPERATIONS WITH EQUIPMENT**

Operation	Operation Month	Tractor	Implement	Labor Type/ Material	Rate/ acre	Unit
Pruning (Custom) Alt Yrs	Jan			Prune	1.00	acre
Prune; Stack & Shred AltYrs	Feb			Stack & Shred Prunings All Alt Yrs	1.00	acre
Irrigate 10X	Apr			Non-Machine Labor	0.12	hour
				Water - Pump	4.20	acin
	May			Non-Machine Labor	0.24	hour
				Water - Pump	8.40	acin
	June			Non-Machine Labor	0.24	hour
				Water - Pump	8.40	acin
	July			Non-Machine Labor	0.24	hour
				Water - Pump	8.40	acin
	Aug			Non-Machine Labor	0.24	hour
				Water - Pump	8.40	acin
Sept			Non-Machine Labor	0.12	hour	
			Water - Pump	4.20	acin	
Ground Squirrel burrows	Apr			Non-Machine Labor	0.17	hour
Fertilize N	Apr			Weevil-Cide (tablets)	16.00	each
				UAN32 (32-0-0)	40.00	lb N
				UAN32 (32-0-0)	40.00	lb N
				UAN32 (32-0-0)	40.00	lb N
				UAN32 (32-0-0)	40.00	lb N
Weed; Strip Spray	Apr		ATV-Mule	Equipment Operator Labor	0.22	hour
				Prowl H2O	0.25	gal
Weed: Mow 5X	Apr	90 HP 4WD	Mower Flail 10'	Weed Sprayer 100 G	8.00	floz
				Roundup Ultra Max	0.22	hour
				Equipment Operator Labor	0.22	hour
				Equipment Operator Labor	0.22	hour
				Equipment Operator Labor	0.22	hour
				Equipment Operator Labor	0.22	hour
Disease: Blight 2X	Apr			Equipment Operator Labor	0.22	hour
				Badge X2	4.00	lb
				Manzate Pro Stick	2.40	lb
				Spray Ground - Air Blast Sprayer	1.00	acre
				Badge X2	4.00	lb
				Manzate Pro Stick	2.40	lb
Gopher	May			Spray Ground - Air Blast Sprayer	1.00	acre
				Non-Machine Labor	0.25	hour
				Weevil-Cide (tablets)	20.00	each
				Non-Machine Labor	0.10	hour
Ground Squirrel (bait stations)	May			Ground Squirrel Bait	3.60	lb
				Non-Machine Labor	0.20	hour
				Ground Squirrel Bait	7.20	lb
Insect: Codling Moth	July			Belt	4.00	floz
				Warrior II	2.00	oz
				Spray Ground - Air Blast Sprayer	1.00	acre
Leaf Sampling	July			Non-Machine Labor		
				Leaf Analysis	0.05	each
Codling moth, husk fly, mite, aphid	July			Lorsban Advanced	4.00	pt
				Nu-Lure Bait	3.00	pt
				Onager	20.00	oz
				Spray Ground - Air Blast Sprayer	1.00	acre
Insect: Husk fly (NuLure Assail) AltR	Aug			Nu-Lure Bait	3.00	pt
				Assail 30 SP	4.00	oz
				Spray Ground - Air Blast Sprayer	0.50	acre
Weed: Spot spray (Rely)	Aug		ATV-Mule	Equipment Operator Labor	0.22	hour
				Weed Sprayer 100 G	8.00	floz
				Rely 280		

UC COOPERATIVE EXTENSION  
 San Joaquin Valley - North 2013  
**Table 8. CONTINUED**

Operation	Operation Month	Tractor	Implement	Labor Type/ Material	Rate/ acre	Unit
Insect: Husk fly, AltR	Sept			Fanfare 2EC	5.00	fl oz
				Nu-Lure Bait	3.00	pt
	Spray Ground - Air Blast Sprayer			0.50	acre	
	Sept			Fanfare 2EC	5.00	fl oz
				Nu-Lure Bait	3.00	pt
	Weed Strip spray)			Nov		ATV-Mule Weed Sprayer 100 G
Equipment Operator Labor		0.22	hour			
Chateau SW		2.00	oz			
Roundup Ultra Max		8.00	fl oz			
Pickup Truck Use	Nov		Pickup Truck 1/2 T	Equipment Operator Labor	2.40	hours
ATV Use	Nov		ATV-Mule	Equipment Operator Labor	1.20	hours
Harvest: Shake, sweep, pickup, haul	Sept			Non-Machine Labor		
				Shake, sweep, pickup, haul	6,000.00	lb
Hull & Dry	Sept			Dry/Hull	6,000.00	lb
CA Walnut Commission	Sept			CA Walnut Commission	6,000.00	lb