
UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2011

SAMPLE COSTS TO ESTABLISH
AN ORCHARD AND PRODUCE

ALMONDS



SAN JOAQUIN VALLEY NORTH MICRO SPRINKLER IRRIGATION

Roger A. Duncan
Paul S. Verdegaal
Brent A. Holtz
David A. Doll
Karen A. Klonsky

UCCE Farm Advisor, Stanislaus County
UCCE Farm Advisor, San Joaquin County
UCCE Farm Advisor / County Director, San Joaquin County
UCCE Farm Advisor, Merced County
UCCE Extension Specialist, Department of Agricultural and Resource
Economics, UC Davis

Richard L. De Moura

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

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

**SAMPLE COSTS TO ESTABLISH an ORCHARD
and PRODUCE ALMONDS**

San Joaquin Valley North - 2011

Micro Sprinkler Irrigation

CONTENTS

INTRODUCTION	2
ASSUMPTIONS.....	3
Establishment Cultural Practices and Material Inputs.....	3
Production Cultural Practices and Material Inputs.....	5
Labor, Equipment and Interest.....	7
Cash Overhead.....	8
Non-Cash Overhead.....	9
REFERENCES	11
Table 1. COSTS PER ACRE TO ESTABLISH AN ALMOND ORCHARD	12
Table 2. COSTS PER ACRE TO PRODUCE ALMONDS	14
Table 3. COSTS AND RETURNS PER ACRE TO PRODUCE ALMONDS	15
Table 4. MONTHLY CASH COSTS – ALMONDS	17
Table 5. RANGING ANALYSIS	19
Table 6. WHOLE FARM EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS.....	20
Table 7. HOURLY EQUIPMENT COSTS	20
Table 8. OPERATIONS WITH EQUIPMENT & MATERIALS.....	21

INTRODUCTION

Sample costs to establish an almond orchard and produce almonds under micro 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 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.

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

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

ASSUMPTIONS

The assumptions refer to Tables 1 to 8 and pertain to sample costs to establish an orchard and produce almonds under micro 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 of and types of cultural practices will vary among growers within the region and from season to season due to variables such as weather, soil, and 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 farmed by the owner. Almonds are being established on 40 acres. A mature almond orchard covers 55 acres; roads, irrigation systems and farmstead occupy the remaining five acres.

Establishment Cultural Practices and Material Inputs (Table 1)

Trees. No specific almond variety is planted in this study, but cultural practices are based on mid-season varieties. Almond orchards will include two or more varieties in which pollen shedding and bloom periods overlap to insure good pollination. Cultivars that might be planted in this region include: A) Early blooming — Sonora; B) Mid-blooming — Aldrich, Nonpareil, Carmel, Monterey, Price, and Fritz; C) Late blooming — Padre, Livingston, and Butte. Planting densities may range from 75 to 180 trees per acre. In this study, 124 trees per acre are planted on a 16-foot X 22-foot spacing (tree x row). The life of the orchard at the time of planting is estimated to be 25 years.

Site Preparation. This 40-acre orchard is established on land previously planted to an orchard. The land is assumed to be well drained and either a class I or II soil.

Orchard Removal. In this study the trees are pushed over and then chipped. The custom operator charges \$350 per acre, plus keeps and sells the wood. The grower then cleans up the orchard for land preparation. To reduce the incidence of diseases and nematodes, the ground should be fallowed for one year after removal.

Land Preparation. The ground is cross-ripped to a six-foot depth by a custom operator to break up hardpan and pull up remaining tree roots, disked twice, and fumigated in the fall, then left unattended over the winter. A custom operator fumigates the tree row area (11 foot strip) with Telone. Fumigation costs also include the grower disking and rolling in the tree row behind the custom fumigator. Prior to planting in January, using GPS, a custom operator makes berms and marks the planting sites. Fall operations that prepare the orchard for planting are done the year prior to planting, but costs are shown in the first year.

Planting, Training, and Pruning. Planting the orchard starts by making a berm and marking the tree sites. In January, the trees are planted, headed, trimmed, painted, and a tree wrap placed around the trunk. The tree wrap protects against above ground rodents, herbicide sprays, and sunburn. Contract labor companies who specialize in orchard planting do the planting operation. In the second year, two trees per acre are replanted. The replant sites are backhoed, fumigated, and replanted by a custom operator. Training, which includes suckering and light pruning for shaping is done during February or March of the first three years. In March of the first year, the trees are suckered. Tree tying is done late (November/December) in the second year or early (January/February) in the third and fourth year. The tie (small rope) is made around the tree about one-third of the way from the top of the tree. The young trees are pruned late to avoid bacterial canker. In the fourth and following years, pruning is done in November or December removing limbs for equipment access and safety.

Fertilization. Beginning in the second year, leaf samples (1 per 20 acres) are taken in July for nutrient analysis. Fertilizers should be applied according to the analysis results. Fertilizer rates in this study are typical nutrient requirements, but do not take into account soil and water nitrogen. In the first year, equally split applications of N are made one-third in the spring (March or April), one third in early summer (June) and one-third in late summer (August). The fertilizer (15-15-15) is broadcast by hand near the base of the tree. In the second year, N is applied monthly from April to August through the irrigation system. CAN-17 (1/3 of N budget) is applied during the first application and UN32 thereafter. In the following years, UN32 is applied monthly. Potassium sulfate (K), 0-0-50, is banded along the tree row in the fall. In years one and two, zinc is applied with the rust spray in late March and with the shothole/scab spray in the following years. In October of the second and subsequent years, Solubor (boron) is applied as a foliar spray. Beginning in the third year, hull samples for boron analysis (1 per 40 acres) are taken, immediately prior to or at harvest. Many orchards on the eastside of the northern San Joaquin Valley are boron deficient and additional boron may be required. Annual rates of actual N, K, and B used in this study are shown in Table A. For both the leaf and hull samples, the grower uses an ATV to collect the samples. For the 40 acres, the estimated time is one hour to collect the samples and one hour to prepare and ship the samples.

Table A. Establishment Years
Applied Actual Nitrogen (N),
Potash (K₂O), Boron (B)

Year	N	K ₂ O	B
lb/acre			
1	20	00 (000)	0.0 (0)
2	40	40 (080)	0.4 (2)
3	80	80 (160)	0.4 (2)
4	120	120 (240)	0.4 (2)
5	160	160 (320)	0.4 (2)
6+	200	200 (400)	0.4 (2)

Parenthesis = actual amount of material applied (0-0-50) and (Solubor)

Irrigation and Frost Protection. Water is pumped from a well and passes through an infiltration system into the micro-sprinklers. Water is applied to the orchard approximately twice a week from mid March through mid October. Frost protection begins in the fourth year and uses two acre-inches annually, applied in February and early March in this study. Irrigation labor is assumed to be 0.09 hours per acre per irrigation and water costs (pumping costs) \$41.28 per acre foot or \$3.44 per acre inch. Table B shows the applied water for each year in this study. Applied water values are substantially greater than the actual tree water requirement due to application inefficiency. Application efficiencies of 90% are used for all years and reflect the differences in evaporative loss due to canopy development. Effective rainfall has not been considered in this study because it is too variable; therefore it is assumed that the season begins with a full soil profile.

Table B. Applied Water per Year

Year	Acre-inch
1	11
2	21
3	32
4+	42

Pollination. Bee hives are placed in the orchard in February prior to bloom by a beekeeper. One hive per acre is set out in the third year and two hives per acre thereafter.

Winter Sanitation. Winter sanitation to remove the mummy nuts begins in December of the fourth year. The mummies are shaken from the trees, blown into the middles and shredded

Pest Management. The pesticides and rates mentioned in this cost study as well as other materials available are listed in *UC Integrated Pest Management Guidelines, Almonds*. Pesticides mentioned in the study are commonly used, but are not recommendations. Adjuvants or surfactants are recommended with many pesticides but are not included as a cost in this study. Growers should monitor pesticide chemistry and modes of action to prevent pesticide resistance by using different materials.

Weeds. In the first year, Gramoxone and Prowl are applied to the tree row (strip spray) in February soon after planting. Also, the row middles are disked, floated and then mowed four times during the year. Spot sprays are usually applied as needed; in this study, Gramoxone is applied as a spot spray in the tree row during June. In the second year, the row middles are mowed seven times, once per month from March through September and six times thereafter, March through August. Roundup is applied as a spot spray, once (April)

during the growing season to the tree row in the second year, but is usually applied as needed. Prowl and Roundup are applied to the tree row during the dormant season (December). Beginning in the third year, the dormant strip spray (Matrix and Roundup) is applied to the tree row in the fall, or winter (November). A preharvest spray (Roundup and Goal) is applied to the orchard floor starting in the third year to clean up the row middles prior to harvest. Although no cost is shown, ammonium sulfate should be used with all sprays to increase efficacy.

Insects. In May of the first and following years, mites are controlled with an Agri-Mek application. Beginning in July of the third year, ant bait (Clinch) is sprinkled on the berms for ant control. Navel orange worms (NOW) are treated with Intrepid beginning in July (hull split spray) of the third year.

Diseases. Rust control is done in the first and second year with an application of Abound (zinc included with spray). In the third and following years, brown rot is treated in February (60 to 80% bloom) with Vanguard; shot hole, scab and rust are treated in March (petal fall or afterwards) with Pristine or Abound (zinc included with spray). Bravo is applied at petal fall for shothole, scab and anthracnose. Sprays are usually applied with a handgun sprayer during the first two years and with an air blast sprayer, thereafter. Materials are applied at reduced volumes (25, 50, 75%) during the first three years, because of the small tree size.

Vertebrates. Gophers can cause major losses to trees. Gophers are managed with the use of poison bait applied in the spring by a mechanical bait applicator. Ground squirrels are managed by late winter use of anti-coagulant bait in aboveground bait stations.

Harvest. Harvest starts in the third year using contract labor for hand harvest (poling). The nuts are moved to the centers by hand raking labor furnished by the grower. Mechanical harvesting and pickup by a custom operator begins in the fourth year. Typical annual yields for almonds are measured in meat (kernel) pounds per acre and are shown in Table C.

Year	Kernel Pounds
3	400
4	800
5	1,600
6+	2,000

Production Cultural Practices and Material Inputs (Tables 2-8)

Winter Sanitation. Winter (December) sanitation destroys over wintering sites for navel orangeworm. The mummy nuts are shaken from the trees, dropped to the orchard floor, blown into the row middles and shredded with a flail mower. Winter sanitation operations except for the shredding are custom hired. Hand poling may be needed in low rainfall years.

Pruning. Maintenance hand pruning for safety and equipment access is done in November or December in this study, but can be done anytime from harvest through the dormant period. Prunings are stacked in the row middles and shredded by a custom operator. Tying and roping may continue to year 7 or 8 depending on previous training and variety.

Tree Replacement. One or more trees per acre may die each year and are replaced in late winter. Costs in this study are basic costs that will vary with each orchard and type of tree loss. Tree replacement is included in investment repairs under Cash Overhead.

Irrigation/Frost Protection. Irrigation costs include pumping (water) and labor costs. The water is pumped from a well and passes through an infiltration system and fed into a micro-sprinkler system. Forty-two acre-inches of water are applied to the orchard based on 90% application efficiency from March to October.

Applied water values are greater than the actual tree water requirement due to application inefficiency. No assumption is made about effective rainfall. An additional two acre inches are applied in February and/or March for frost protection. Water cost or pumping costs are \$3.44 per acre inch based on current PG&E agricultural rates. Rates will vary depending upon pump and well specifications and rate program selected. Irrigation labor is 0.09 hours per acre per irrigation.

Pollination. Two hives (8+ frames/hive) per acre are contracted for pollination and set in the orchard by the beekeeper prior to bloom (February).

Fertilization. Nitrogen (N) at 200 pounds per acre per season as UN32 is applied monthly March through September through the irrigation system. Neutral zinc at five pounds per acre is foliar applied with an insecticide or fungicide spray at pink bud in March. Potassium sulfate is banded in the fall (October) along the tree row at 400 pounds of material or 200 pounds of K₂O per acre. Boron at 0.4 pounds per acre or two pounds of Solubor is foliar applied in October.

Sampling. Tree nutrient status is determined by leaf and hull analysis. Leaf samples at one per 20 acres are taken in July. A hull sample at one per 40 acres is taken from the windrow at harvest. The grower uses an ATV to collect the samples which is assumed to take one hour per 40 acres (0.025 hrs/acre) each time. In addition another hour is required to prepare and ship the samples to a commercial lab for analysis.

Pest Management. The pesticides and rates mentioned in this cost study are listed in *UC Integrated Pest Management Guidelines, Almonds*. For more information on other pesticides available, pest identification, monitoring, and management visit the UC IPM website at <http://www.ipm.ucdavis.edu/>. Cultural practices are discussed in the publications *Integrated Pest Management for Almonds* and *Almond Production Manual*. 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 (PCA). Written recommendations are required for many pesticides and are made by licensed pest control advisers. In addition the PCA can monitor the field for agronomic problems including pests and nutrition. Growers may hire private PCAs or receive the service as part of a service agreement with an agricultural chemical and fertilizer company. No costs are shown for a PCA in this study.

Weeds. A dormant strip spray is applied in November or December using pre-emergent and contact herbicides (Roundup, Matrix) to control weeds in the tree rows. Row middles are mowed six times, once per month March through August. Rely is applied as a strip or spot spray in April/May or as needed. A preharvest spray (Roundup, Goal) is applied in August to prepare the orchard floor for harvest.

Insect and Mite. Mites are sprayed with Agri-Mek in May. Clinch is applied on the berms in July for ant control. At the beginning of hull split in July, Intrepid is applied to control navel orange worm (NOW). NOW is also managed by early harvest and winter sanitation. Check for San Jose scale; in some year's dormant oil applications may be necessary, also if twig borers are present additional sprays may be needed.

Disease. Brown rot is controlled at 60 to 80% bloom in February with Vanguard. Shot hole, scab and rust treatments with Pristine or Abound, are made in March at petal fall or afterwards. Also at petal fall, brown rot, scab and anthracnose are controlled with an application of Bravo.

Vertebrate Pest. Gophers are managed with the use of poison bait applied in the spring using a mechanical applicator. Ground squirrels are managed by late winter fumigation and/or the use of anti-coagulant baits on above ground bait stations during the growing season when rodents accept grain.

Harvest. A custom operator mechanically harvests the almond crop. The grower furnishes labor for hand raking to move nuts missed by the sweeper into the windrows. Harvest begins in August with the early maturing varieties and continues into October for late maturing varieties. In this study, harvest is in September. An inertia trunk shaker is the most common shaker in almonds. The shaker head attaches to the tree trunk to shake the nuts from the tree. The nuts fall to the ground and in a separate operation are blown from around the tree and swept into windrows to dry. A pickup machine gathers the nuts from the windrow and loads them into a cart or bankout wagon. In this study the nuts are elevated or dumped into bottom dump trailers with extended sides for delivery to the huller.

Yields and Returns. Typical annual yields for almonds are measured in meat pounds per acre and are shown in Table C. An estimated price of a \$1.50 per pound of almonds is used in this study to determine potential profits/losses. Returns will vary during the year, depending upon the market. The yields and prices used in this cost study are estimated based on 2005 to 2009 USDA California grower returns.

Assessment. The Almond Board of California (ABC) assesses all almonds commercially grown in the state to pay for almond promotions and research. The mandatory assessment is paid by processors and is not reflected in grower costs.

Pickup/ATV. The study assumes business use mileage of 4,000 miles per year for the pickup. The ATV is used for spot spraying, baiting ants and gophers and is included in those costs. Additional ATV use for checking the orchard, diseases and irrigation system is shown as a line item. The business use is estimated and not taken from any specific data.

Labor, Equipment, and Interest

Labor. Hourly wages for workers are \$12.00 for machine operators and \$8.00 per hour non-machine labor. Adding 33% for the employer's share of federal and state payroll taxes, workers compensation insurance, for nut crops (0045) and other possible benefits gives the labor rates shown of \$15.96 and \$10.64 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, 2010 (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 \$2.60 and \$3.10 per gallon, respectively. The cost includes a 2% local sales tax on diesel fuel and 8% sales tax on gasoline. Gasoline also includes federal and state excise tax, which are refundable for on-farm use when filing your income tax. The fuel, lube, and repair cost per acre for each operation in Table 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 2011.

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 Costs

Cash overhead consists of various cash expenses paid out during the year that are assigned to the whole farm and not to a particular operation. These costs include property taxes, interest on operating capital, office expense, liability and property insurance, sanitation services, equipment repairs, and management.

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

Insurance. Insurance for farm investments varies depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.767% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$581 for the entire farm.

Office Expense. Office and business expenses are estimated at \$50 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.

Environmental/Regulatory Costs. Various environmental fees are collected by the county and state. The fees will vary by county. For example there are fees assessed by the Air Resources Board (state agency) regulating air pollution, a Water Coalition Fee (local coalition), formerly called an Ag Waiver Fee for water discharges, and hazardous material storage fee (local coalition). The grower must also provide safety training, safety equipment, and maintain training records. For this study, a cost of \$10.00 per producing acre or \$950 for the farm is assumed.

Sanitation Services. Sanitation services provide one portable toilet and cost the farm \$640 annually. The cost includes one single toilet unit with washbasin, delivery and 4 months of weekly service.

Managers Salary. No salary is shown. The farm is owned and operated by the grower, therefore returns above cost are assumed to go to management (grower).

Investment Repairs. Annual maintenance 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 0.50% of the establishment cost or \$1,010 (\$25.25 per acre) per year.

Non-Cash Overhead Costs

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

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

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery (tractors and implements) the remaining value is a percentage of the new cost of the investment (Boehlje and Eidman). The percent remaining value is calculated from equations developed by the American Society of Agricultural Engineers (ASAE) based on equipment type and years of life. The life in years is estimated by dividing the wear out life, as given by ASAE by the annual hours of use in this operation. For other investments including irrigation systems, buildings, and miscellaneous equipment, the value at the end of its useful life is zero. The salvage value for land is the purchase price because land does not depreciate. The purchase price and salvage value for equipment and investments are shown in 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. The interest rate of 5.75% is used to calculate capital recovery. The rate will vary depending upon size of loan and other lending agency conditions, but is a suggested rate by a farm lending agency in January 2011.

Establishment Cost. Costs to establish the orchard are used to determine capital recovery expenses, depreciation, and interest on investment for the production years. Establishment cost is the sum of the costs for land preparation, planting, trees, cash overhead and production expenses for growing the trees through the first year that almonds are harvested minus any returns from production. The Total Accumulated Net Cash Cost on Table 1, in the third year represents the establishment cost. For this study the cost is \$5,049 per acre or \$201,953 for the 40-acre orchard. The establishment cost is spread over the remaining 22 years of the 25 years the orchard is in production. Establishment costs in this study are based on typical basic operations, but can vary considerably, depending upon terrain, soil type, local regulations, and other factors.

Sprinkler Irrigation System. The sprinkler system consists of micro-sprinklers installed on the 40 acres in the tree row and includes a filtration/injection system located near the pumping plant.

Irrigation Pumping System. A 200 foot deep well with a pumping level at 75-feet is drilled on the site and a new 25 horsepower pump installed to irrigate the 40 acres.

Land. Bare land values range from \$5,000 to \$25,000 per acre depending upon water source (well, district or surface water). Land with available surface water ranges from \$10,000 to \$25,000 per acre. Land in this study is valued at \$15,000 per acre or \$15,790 per producing acre. Land values with planted almonds range from \$12,000 to \$25,000.

Building. The metal building(s) are on a cement slab and total approximately 2,400 square feet. The buildings are used for shops and equipment storage. The buildings are located on the grower owned land.

Shop/FieldTools. This includes shop tools and equipment, hand tools, and miscellaneous field tools including pruning equipment. The cost is assumed and not based on any collected data.

Fuel Tanks. Two 500-gallon fuel tanks using gravity feed are on metal stands. The tanks are setup in a cement containment pad that meets federal, state, and county regulations.

Equipment. Farm equipment is purchased new or used, but the study shows the current purchase price for new equipment. The new purchase price is adjusted to 60% to indicate a mix of new and used equipment. Annual ownership costs for equipment and other investments are shown in 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. 2009. Annual Crop Reports. Merced County, San Joaquin County, and Stanislaus County.
- American Society of Agricultural Engineers. 1994. American Society of Agricultural Engineers Standards Yearbook. Russell H. Hahn and Evelyn E. Rosentreter (ed.) St. Joseph, Missouri. 41st edition.
- Boehlje, Michael D., and Vernon R. Eidman. 1984. Farm Management. John Wiley and Sons. New York, New York
- California Chapter of the American Society of Farm Managers and Rural Appraisers. 2010. *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 2011. <http://www.boe.ca.gov/sptaxprog/spfdrates.htm>
- Energy Information Administration. 2010. *Weekly Retail on Highway Diesel and Gasoline Prices*. Internet accessed January 2011. <http://tonto.eia.doe.gov/oog/info/wohdp>
- Doanes Editors. *Facts and Figures for Farmers*. 1977. Doane Publishing, St. Louis, MO. P 292.
- Duncan, Roger, Paul Verdegaal, Brent A. Holtz, Karen M. Klonsky and Richard L. De Moura. 2006. *Sample Cost to Establish an Almond Orchard and Produce Almonds, San Joaquin Valley North, Micro-Sprinkler Irrigation*. University of California Cooperative Extension. Department of Agricultural and Resource Economics. Davis, CA.
- University of California Statewide Integrated Pest Management Program. *UC Pest Management Guidelines, Almonds*. 2009. University of California, Davis, CA. <http://www.ipm.ucdavis.edu>
- University of California, Division of Agriculture and Natural Resources. 1996. Almond Production Manual. University of California, Division of Agriculture and Natural Resources. Oakland, California. Publication 3364.
- USDA, NASS, California Field Office. 2010. *2009 California Almond Acreage Report*. Almond Board of California. <http://www.almondboard.com/>

For information concerning the above mentioned University of California publications contact UC DANR Communications Services (1-800-994-8849) or your local county Cooperative Extension office.

UC COOPERATIVE EXTENSION
Table 1. COSTS PER ACRE TO ESTABLISH AN ALMOND ORCHARD
 SAN JOAQUIN VALLEY - NORTH 2011

Year	Cost Per Acre				
	1st	2nd	3rd	4th	5th
Meat Pounds Per Acre			400	800	1,600
Planting Costs:					
Orchard Removal: (custom)	350				
Orchard Removal; Field Cleanup	128				
Land Preparation:- Subsoil 2X 6' depth (custom)	400				
Land Preparation: Disc 2X (custom)	60				
Fumigate: Tree Row 11' width (custom)	320				
Land Preparation: Disc & Roll Tree Row	8				
Land Preparation: Pull Berms & Mark Tree Sites (GPS)	30				
Plant, Top, Paint, Wrap Trees (Yr 2 included backhoe cost)	223	44			
Trees: 124 Per Acre (1% Replant In 2nd Year)	651	11			
TOTAL PLANTING COSTS	2,170	54			
Cultural Costs:					
Pollination: Hives			140	280	280
Disease: Brown Rot (Vanguard)			34	34	34
Disease: Shothole/Scab (Abound) Petal Fall. Fertilizer: (Zinc)			71	74	74
Disease: Rust (Abound). Fertilizer: (Zinc)	27	42			
Disease: Shothole/Scab/Anthracnose (Bravo)			44	44	44
Irrigate: Frost Protection				9	9
Vertebrate: Gopher & Squirrel (Bait)	34	34	34	34	34
Fertilize: (15-15-15)	97				
Fertilize N (Yr 2, CAN 17 & UN32. Yr 3+, UN32, 5X)		29	54	80	107
Weed: Disk	8				
Weed: Float	7				
Weed: Mow (Yr 1, 4X. Yr 2-3, 7X. Yr 4+, 6X)	27	48	48	41	41
Irrigate: (water + labor)	91	126	164	198	198
Insect: Mites (Agrimek)	20	29	37	46	46
Fertilize: Leaf Samples for NPK (ATV, labor, analysis)		3	3	3	3
Insect: Worm (Intrepid) Hull Split			53	67	67
Insect: Ants (Clinch)			5	5	5
Weed: Orchard Floor (Roundup, Goal) Preharvest			34	34	34
Fertilize: Hull Analysis for Boron (ATV, labor, analysis)				1	1
Fertilize: Foliar, Boron (Solubor)		12	12	12	12
Fertilize: Potassium Sulfate			70	104	137
Weed: Spot Spray (Yr. 1, Gramoxone 1X. Yr. 2, Roundup 1X)	5	9			
Weed: Strip Spray post plant (Prowl, Gramoxone)	34				
Weed: Dormant Strip Spray (Yr 2, Prowl, Roundup) (Yr 3+ Roundup, Matrix)		33	105	105	105
Prune and/or Train and/or Sucker	54	53	43	138	138
Prune: Stack Prunings			11	16	16
Prune: Shred			29	29	29
Prune/Train: Tie/Rope Trees			48	80	95
Winter Sanitation: Knock Mummies, (Blow, Rake, Shred)				166	166
Pickup Truck Use	100	100	100	100	100
ATV Truck Use	23	23	23	23	23
TOTAL CULTURAL COSTS	529	541	1,161	1,724	1,799
Harvest Costs:					
Pole Trees			29		
Shake Trees				98	98
Sweep Nuts				62	62
Hand Rake			29	3	3
Pick Up and Haul			77	78	81
Hull Nuts			20	40	80
TOTAL HARVEST COSTS			155	281	324
Interest On Operating Capital @ 5.75%	163	21	24	26	27
TOTAL OPERATING COSTS/ACRE	2,862	615	1,341	2,031	2,150

UC COOPERATIVE EXTENSION

Table 1. continued

Year	Cost Per Acre				
	1st	2nd	3rd	4th	5th
Meat Pounds Per Acre			400	800	1,600
Cash Overhead Costs:					
Office Expense	75	75	75	75	75
Liability Insurance	6	6	6	6	6
Sanitation Fees	7	7	7	7	7
Environmental Fee	10	10	10	10	10
Property Taxes	176	176	176	176	176
Property Insurance	14	14	14	14	14
Investment Repairs	59	59	59	59	59
TOTAL CASH OVERHEAD COSTS	347	347	348	348	348
TOTAL CASH COSTS/ACRE	3,209	962	1,689	2,379	2,498
INCOME/ACRE FROM PRODUCTION			800	1,600	3,200
NET CASH COSTS/ACRE FOR THE YEAR	3,209	962	889	779	
PROFIT/ACRE ABOVE CASH COSTS					702
ACCUMULATED NET CASH COSTS/ACRE	3,209	4,171	5,059	5,838	5,136
Non-Cash Overhead Costs, (Capital Recovery):					
Buildings 2400 sqft	66	66	66	66	66
Land	750	750	750	750	750
Fuel Tanks 2-500 gal	5	5	5	5	5
Shop/Field Tools/Equipment	15	15	15	15	15
Pump Refurbished (40 acres)	35	35	35	35	35
Micro-Sprinkler Irrigation System (40 acres)	97	97	97	97	97
Equipment	64	48	61	60	60
TOTAL NON-CASH OVERHEAD COST/ACRE	1,032	1,016	1,029	1,028	1,028
TOTAL COST/ACRE FOR THE YEAR	4,241	1,978	2,718	3,407	3,526
INCOME/ACRE FROM PRODUCTION			800	1,600	3,200
TOTAL NET COST/ACRE FOR THE YEAR	4,241	1,978	1,918	1,807	326
NET PROFIT/ACRE ABOVE TOTAL COST					
TOTAL ACCUMULATED NET COST/ACRE	4,241	6,219	8,136	9,943	10,269

UC COOPERATIVE EXTENSION
Table 2. COSTS PER ACRE TO PRODUCE ALMONDS
 SAN JOAQUIN VALLEY - NORTH 2011

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:							
Pollination (2 hives)	0.00	0	0	0	280	280	
Disease: Brown Rot (Vanguard)	0.31	6	5	24	0	34	
Irrigate: Frost Protection	0.18	2	0	7	0	9	
Disease: Shothole/Scab/Rust (Abound). Fertilize: (Zn)	0.31	6	5	63	0	74	
Vertebrate: Gopher & Squirrel (Bait)	0.66	13	3	19	0	34	
Fertilize: N @ 200 lb N/acre (UN32)	0.00	0	0	134	0	134	
Weed: Mow 6X	1.16	22	19	0	0	41	
Irrigate: (water & labor) 56X	5.04	54	0	144	0	198	
Disease: Shothole/Scab/Anthracnose (Bravo).	0.31	6	5	33	0	44	
Weed: Strip Spray (Rely)	0.23	4	3	12	0	19	
Insect: Mites (AgriMek)	0.31	6	5	35	0	46	
Fertilize: Leaf Samples (collect & analysis) NPK	0.03	1	0	0	2	3	
Insect: NOW (Intrepid)	0.31	6	5	56	0	67	
Insect: Ants (Clinch)	0.08	2	0	13	0	15	
Weed: Preharvest Spray Orchard Floor (Roundup, Goal)	0.23	4	3	19	0	27	
Fertilize: Hull Samples (collect & analysis) B	0.03	1	0	0	1	1	
Fertilize: Foliar Spray (Solubor) B	0.31	6	5	1	0	12	
Fertilize: Potassium Sulfate	0.08	1	1	168	0	171	
Weed: Winter Strip (Roundup, Matrix)	0.23	4	3	93	0	101	
Prune: Hand (maintenance pruning)	13.00	138	0	0	0	138	
Prune: Stack Prunings	1.50	16	0	0	0	16	
Prune: Shred Prunings (brush)	0.00	0	0	0	29	29	
Winter Sanitation: Shake Mummies, Rake, Sweep, Shred	0.09	4	1	0	160	166	
Pickup Truck Ranch Use	3.33	64	37	0	0	100	
ATV: General Use	1.00	19	4	0	0	23	
TOTAL CULTURAL COSTS	28.73	386	105	821	471	1,782	
Harvest:							
Shake	0.00	0	0	0	98	98	
Sweep	0.00	0	0	0	62	62	
Hand Rake Nuts	0.25	3	0	0	0	3	
Pickup and Haul Nuts	0.00	0	0	0	83	83	
Hull and Shell Nuts	0.00	0	0	0	100	100	
TOTAL HARVEST COSTS	0.25	3	0	0	343	345	
Interest on operating capital @ 5.75%						24	
TOTAL OPERATING COSTS/ACRE		388	105	821	813	2,151	
CASH OVERHEAD:							
Office Expense						75	
Liability Insurance						6	
Sanitation Fees						7	
Environmental/Regulatory Fee						10	
Property Taxes						202	
Property Insurance						34	
Investment Repairs						85	
TOTAL CASH OVERHEAD COSTS						418	
TOTAL CASH COSTS/ACRE						2,569	
Non-Cash Overhead (Capital Recovery) Investment							
		Per producing Acres		Annual Cost Capital Recovery			
Buildings		842		66		66	
Land		15,789		750		750	
Fuel Tanks 2-500g		69		5		5	
Shop & Field Tools		158		15		15	
Sprinkler Irrigation System		500		35		35	
Pump Refurbished		1,400		97		97	
Orchard Establishment Costs		5,059		376		376	
Equipment		615		59		62	
TOTAL NON-CASH OVERHEAD COSTS		24,433		1,403		1,405	
TOTAL COSTS/ACRE						3,974	

UC COOPERATIVE EXTENSION
Table 3. COSTS AND RETURNS PER ACRE TO PRODUCE ALMONDS
 SAN JOAQUIN VALLEY - NORTH 2011

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Almonds	2,000.00	lb	1.50	3,000	
OPERATING COSTS					
Insecticide:					
Agri-Mek 0.15 EC	15.00	floz	2.35	35	
Intrepid 2F	18.00	floz	3.11	56	
Clinch	1.00	lb	12.74	13	
Fungicide:					
Vanguard WF	5.00	oz	4.71	24	
Abound	14.00	floz	3.71	52	
Bravo Weatherstik	4.00	pint	8.23	33	
Rodenticide:					
Gopher Bait	1.50	lb	7.87	12	
Squirrel Bait	1.50	lb	4.54	7	
Herbicide:					
Rely 200	1.20	pint	9.72	12	
Roundup Ultra Max	2.00	pint	4.75	10	
Goal 2 XL	1.25	pint	9.73	12	
Matrix SG	4.00	oz	22.69	91	
Fertilizer:					
Neutral Zinc	5.00	lb	2.20	11	
UN-32	200.00	lb N	0.67	134	
Solubor (Boron)	2.00	lb	0.72	1	
Potassium Sulfate (0-0-50)	400.00	lb	0.42	168	
Irrigation:					
Water - Pumped	44.00	acin	3.44	151	
Custom/Contract:					
Hives (Pollination)	2.00	hives	140.00	280	
Leaf Analysis: NPK (2 samples/40 acres)	0.05	each	32.00	2	
Hull Analysis: B (1 sample/40 acres)	0.03	each	17.00	0	
Shake Trees	2.00	hour	98.00	196	
Sweep Nuts	2.00	hour	62.00	124	
Pickup Nuts	1.00	acre	75.00	75	
Haul Nuts	20.00	cwt	0.38	8	
Hull & Shell Nuts	2,000.00	lb	0.05	100	
Shred Brush	0.10	hour	285.00	29	
Labor (machine)	10.81	hrs	15.96	173	
Labor (non-machine)	20.28	hrs	10.64	216	
Fuel - Gas	10.12	gal	3.10	31	
Fuel - Diesel	13.65	gal	2.60	35	
Lube				10	
Machinery repair				28	
Interest on operating capital @ 5.75%				24	
TOTAL OPERATING COSTS/ACRE				2,151	
NET RETURNS ABOVE OPERATING COSTS				849	
CASH OVERHEAD COSTS:					
Office Expense				75	
Liability Insurance				6	
Sanitation Fees				7	
Environmental/Regulatory Fee				10	
Property Taxes				202	
Property Insurance				34	
Investment Repairs				85	
TOTAL CASH OVERHEAD COSTS/ACRE				418	
TOTAL CASH COSTS/ACRE				2,569	

UC COOPERATIVE EXTENSION

Table 3. continued

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Buildings				66	
Land				750	
Fuel Tanks 2-500g				5	
Shop & Field Tools				15	
Sprinkler Irrigation System				35	
Pump Refurbished				97	
Orchard Establishment Costs				376	
Equipment				62	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				1,405	
TOTAL COSTS/ACRE				3,974	
NET RETURNS ABOVE TOTAL COSTS				-974	

UC COOPERATIVE EXTENSION
Table 4. MONTHLY PER ACRE CASH COSTS - ALMONDS
 SAN JOAQUIN VALLEY - NORTH 2011

Beginning JAN 11	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Ending DEC 11	11	11	11	11	11	11	11	11	11	11	11	11	
Cultural:													
Pollination (2 hives)		280											280
Disease: Brown Rot (Vanguard)		34											34
Irrigate: Frost Protection		4	4										9
Disease: Shothole/Scab/Rust (Abound). Fertilize: (Zn)			74										74
Vertebrate: Gopher & Squirrel (Bait)			19					14					34
Fertilize: N @ 200 lb N/acre (UN32)				27	27	27	27	27					134
Weed: Mow 6X			7	7	7	7	7	7					41
Irrigate: (water & labor) 56X			7	19	26	33	39	34	27	14			198
Disease: Shothole/Scab/Anthracnose (Bravo).				44									44
Weed: Strip Spray (Rely)					19								19
Insect: Mites (AgriMek)					46								46
Fertilize: Leaf Samples (collect & analysis) NPK							3						3
Insect: NOW (Intrepid)							67						67
Insect: Ants (Clinch)							15						15
Weed: Preharvest Spray Orchard Floor (Roundup, Goal)								27					27
Fertilize: Hull Samples (collect & analysis) B									1				1
Fertilize: Foliar Spray (Solubor) B										12			12
Fertilize: Potassium Sulfate										171			171
Weed: Winter Strip (Roundup, Matrix)											101		101
Prune: Hand (maintenance pruning)											138		138
Prune: Stack Prunings											16		16
Prune: Shred Prunings (brush)											29		29
Winter Sanitation: Shake Mummies, Rake, Sweep, Shred												166	166
Pickup Truck Ranch Use	8	8	8	8	8	8	8	8	8	8	8	8	100
ATV: General Use	2	2	2	2	2	2	2	2	2	2	2	2	23
TOTAL CULTURAL COSTS	10	329	122	107	135	77	167	120	38	208	294	176	1,782
Harvest:													
Shake									98				98
Sweep									62				62
Hand Rake Nuts									3				3
Pickup and Haul Nuts									83				83
Hull and Shell Nuts									100				100
TOTAL HARVEST COSTS									345	0	0	0	345
Interest on operating capital @ 5.75%	0	2	2	2	3	4	5	5	7	-3	-2	-1	24
TOTAL OPERATING COSTS/ACRE	10	331	124	109	138	80	171	125	391	204	292	175	2,151

UC COOPERATIVE EXTENSION

Table 4. continued

Beginning JAN 11	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Ending DEC 11	11	11	11	11	11	11	11	11	11	11	11	11	
CASH OVERHEAD:													
Office Expense	6	6	6	6	6	6	6	6	6	6	6	6	75
Liability Insurance		6											6
Sanitation Fees	7												7
Environmental/Regulatory Fee				10									10
Property Taxes	101						101						202
Property Insurance	17						17						34
Investment Repairs	7	7	7	7	7	7	7	7	7	7	7	7	85
TOTAL CASH OVERHEAD COSTS	138	19	13	23	13	13	131	13	13	13	13	13	418
TOTAL CASH COSTS/ACRE	148	350	138	132	152	94	302	138	404	218	305	188	2,569

UC COOPERATIVE EXTENSION
Table 5. RANGING ANALYSIS
 SAN JOAQUIN VALLEY - NORTH 2011

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE ALMONDS

	YIELD (lb/acre)						
	1,400	1,600	1,800	2,000	2,200	2,400	2,600
OPERATING COSTS/ACRE:							
Cultural Cost	1,782	1,782	1,782	1,782	1,782	1,782	1,782
Harvest Cost	312	323	334	345	356	367	378
Interest on operating capital @ 5.75%	24	24	24	24	24	24	24
TOTAL OPERATING COSTS/ACRE	2,118	2,129	2,140	2,151	2,162	2,173	2,184
TOTAL OPERATING COSTS/LB	1.51	1.33	1.19	1.08	0.98	0.91	0.84
CASH Overhead Costs/ACRE							
CASH Overhead Costs/ACRE	418	418	418	418	418	418	418
TOTAL CASH COSTS/ACRE	2,536	2,547	2,558	2,569	2,580	2,591	2,602
TOTAL CASH COSTS/LB	1.81	1.59	1.42	1.28	1.17	1.08	1.00
NON-CASH Overhead Costs/ACRE							
NON-CASH Overhead Costs/ACRE	1,405	1,405	1,405	1,405	1,405	1,405	1,405
TOTAL COSTS/ACRE	3,941	3,952	3,963	3,974	3,985	3,996	4,007
TOTAL COSTS/LB	2.81	2.47	2.20	1.99	1.81	1.66	1.54

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE \$/lb	YIELD (lb/acre)						
	1,400	1,600	1,800	2,000	2,200	2,400	2,600
0.90	-858	-689	-520	-351	-182	-13	156
1.10	-578	-369	-160	49	258	467	676
1.30	-298	-49	200	449	698	947	1,196
1.50	-18	271	560	849	1,138	1,427	1,716
1.70	262	591	920	1,249	1,578	1,907	2,236
1.90	542	911	1,280	1,649	2,018	2,387	2,756
2.10	822	1,231	1,640	2,049	2,458	2,867	3,276

NET RETURNS PER ACRE ABOVE CASH COSTS

PRICE \$/lb	YIELD (lb/acre)						
	1,400	1,600	1,800	2,000	2,200	2,400	2,600
0.90	-1,276	-1,107	-938	-769	-600	-431	-262
1.10	-996	-787	-578	-369	-160	49	258
1.30	-716	-467	-218	31	280	529	778
1.50	-436	-147	142	431	720	1,009	1,298
1.70	-156	173	502	831	1,160	1,489	1,818
1.90	124	493	862	1,231	1,600	1,969	2,338
2.10	404	813	1,222	1,631	2,040	2,449	2,858

NET RETURNS PER ACRE ABOVE TOTAL COSTS

PRICE \$/lb	YIELD (lb/acre)						
	1,400	1,600	1,800	2,000	2,200	2,400	2,600
0.90	-2,681	-2,512	-2,343	-2,174	-2,005	-1,836	-1,667
1.10	-2,401	-2,192	-1,983	-1,774	-1,565	-1,356	-1,147
1.30	-2,121	-1,872	-1,623	-1,374	-1,125	-876	-627
1.50	-1,841	-1,552	-1,263	-974	-685	-396	-107
1.70	-1,561	-1,232	-903	-574	-245	84	413
1.90	-1,281	-912	-543	-174	195	564	933
2.10	-1,001	-592	-183	226	635	1,044	1,453

UC COOPERATIVE EXTENSION
Table 6. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS
 SAN JOAQUIN VALLEY - NORTH 2011

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
						Insur- ance	Taxes	
11	66 HP 2WD Tractor	37,773	20	4,847	2,817	165	213	3,195
11	ATV 4WD	6,500	7	2,466	808	35	45	888
11	Mower/Chopper - 8'	9,600	10	1,698	1,092	44	56	1,192
11	Orch. Sprayer 500 G	21,000	15	2,016	1,894	89	115	2,098
11	Pickup 1/2 ton	28,000	7	10,621	3,481	150	193	3,824
11	Spin/Spreader-Pull	14,000	20	730	1,077	57	74	1,208
11	Weed Sprayer 100 G	5,500	10	973	625	25	32	683
TOTAL		122,373		23,351	11,793	565	729	13,087
60% of New Cost*		73,424		14,011	7,076	339	437	7,852

*Used to reflect a mix of new and used equipment

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insur- ance	Taxes	Repairs	
INVESTMENT								
Orchard Establishment	202,374	22		15,026	784	1,012	1,010	17,832
Buildings, 2400 sqft	80,000	20		6,284	310	400	1,600	8,594
Sprinkler Irrigation System	56,000	25		3,874	217	280	1,120	5,491
Pump 25HP Refurbished	20,000	25		1,384	78	100	400	1,961
Fuel Tanks 2-500g	6,514	20	651	491	28	36	130	685
Land	1,500,000	22	1,500,000	71,250	0	15,000	0	86,250
Shop & Field Tools/Equipment	15,000	15		1,421	58	75	300	1,854
TOTAL INVESTMENT	1,879,888		1,500,651	99,730	1,475	16,903	4,560	122,668

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Environmental/Regulatory Fee	95	acre	10	950
Liability Insurance	100	acre	5.81	581
Office Expense	95	acre	75.00	7,125
Sanitation Fees	95	acre	6.74	640

UC COOPERATIVE EXTENSION
Table 7. HOURLY EQUIPMENT COSTS
 SAN JOAQUIN VALLEY - NORTH 2011

Yr	Description	Actual Hours Used	COSTS PER HOUR						
			Capital Recovery	Cash Overhead		Operating			Total Costs/Hr
				Insur- ance	Taxes	Repairs	Fuel & Lube	Total Oper.	
11	66 HP 2WD Tractor	600	2.82	0.17	0.21	1.61	9.54	11.15	14.35
11	ATV 4WD	285	1.70	0.07	0.09	0.48	3.56	4.04	5.90
11	Mower/Chopper - 8'	200	3.28	0.13	0.17	4.05	0.00	4.05	7.63
11	Orch. Sprayer 500 G	130	8.75	0.41	0.53	3.46	0.00	3.46	13.15
11	Pickup 1/2 ton	285	7.32	0.31	0.41	2.07	8.91	10.98	19.02
11	Spin/Spreader-Pull	60	10.76	0.56	0.74	5.24	0.00	5.24	17.30
11	Weed Sprayer 100 G	150	2.51	0.10	0.13	1.48	0.00	1.48	4.22

UC COOPERATIVE EXTENSION
Table 8. OPERATIONS WITH EQUIPMENT and MATERIALS
 SAN JOAQUIN VALLEY NORTH - 2011

Operation	Operation Month	Equipment Tractor	Implement	Non-Mach Labor hrs/acre	Material	Broadcast Rate/acre	Unit
Cultural:							
Pollination	February	Custom			Hives	2.00	each
Disease: Brown Rot	February	66HP 2WD	Orchard Sprayer		Vanguard	5.00	oz
Disease: Shothole & Scab. Fertilizer: Foliar	March	66HP 2WD	Orchard Sprayer		Abound	14.00	floz
					Neutral Zinc	5.00	lb
Disease: Shothole, Scab, Anthracnose	April	66HP 2WD	Orchard Sprayer		Bravo	4.00	pint
Vertebrate: Gopher & Squirrel	March	ATV			Gopher Bait	1.50	lb
	August	ATV			Squirrel Bait	1.50	lb
Fertilize: N (through sprinklers)	April				UN32	40.00	lb N
	May				UN32	40.00	lb N
	June				UN32	40.00	lb N
	July				UN32	40.00	
	August				UN32	40.00	
Weed: Mow	March	66HP 2WD	Mower/Chopper				
	April	66HP 2WD	Mower/Chopper				
	May	66HP 2WD	Mower/Chopper				
	June	66HP 2WD	Mower/Chopper				
	July	66HP 2WD	Mower/Chopper				
	August	66HP 2WD	Mower/Chopper				
Irrigate: Frost Protection	February			0.09	Water	1.00	acin
	March			0.09	Water	1.00	acin
Irrigate: water & labor	March			0.36	Water	1.00	acin
	April			0.72	Water	3.25	acin
	May			0.72	Water	5.25	acin
	June			0.72	Water	7.25	acin
	July			0.72	Water	9.00	acin
	August			0.72	Water	7.75	acin
	September			0.36	Water	5.50	acin
	October			0.30	Water	3.00	acin
Insect: Mites	May	66HP 2WD	Orchard Sprayer		AgriMek	15.00	floz
Fertilize: Leaf Samples	July	ATV		0.03	Analysis	0.05	each
Insect: Worms	July	66HP 2WD	Orchard Sprayer		Intrepid	18.00	floz
Insect: Ants	July	ATV			Clinch	0.25	lb
Weed: Strip Spray	May	66HP 2WD	Weed Sprayer		Rely	1.25	pint
Weed: Spray Orchard Floor (Preharvest)	August	66HP 2WD	Weed Sprayer		Roundup	3.00	pint
					Goal	1.25	pint
Harvest: Shake Trees	September	Custom			Shake	1.00	hour
Harvest: Sweep Nuts	September	Custom			Sweep	1.00	hour
Harvest: Hand Rake Nuts	September			0.30			
Harvest: Pickup & Haul Nuts	September	Custom			Pickup		
					Haul	20.00	cwt
Hull & Shell Nuts	September	Custom			Hull & Shell	2,000.00	lb
Fertilizer: Hull Samples	September	ATV		0.03	Analysis	0.03	each
Fertilize: Foliar Spray (Boron)	October	66HP 2WD	Orchard Sprayer		Solubor	2.00	lb
Fertilize: Potassium sulfate	October	66HP 2WD	Spreader		0-0-50	400.00	lb
Weed: Winter Strip	November	66HP 2WD	Weed Sprayer		Roundup	1.50	pint
					Matrix	4.00	oz
Prune: Hand	November			13.00			
Prune: Stack Prunings	November			1.50			
Prune: Shred Prunings	November	Custom			Shred	0.10	hour
Winter Sanitation:	December	66HP 2WD	Mower/Chopper				
		Custom			Shake	1.00	hour
		Custom		0.30	Sweep	1.00	hour