UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2006

SAMPLE COSTS TO ESTABLISH AN ORCHARD AND PRODUCE

ALMONDS

SACRAMENTO VALLEY

Low-volume sprinkler

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INTRODUCTION

The sample costs to establish an almond orchard and produce almonds under microsprinkler or low volume irrigation in the Sacramento 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 3 and 4 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) 752-4424 or obtained from the local county UC Cooperative Extension offices. Many archived studies are also available on the website.

ASSUMPTIONS

The assumptions refer to Tables 1 to 9 and pertain to sample costs to establish an orchard and produce almonds under micro sprinkler irrigation or low volume irrigation in the Sacramento Valley. The cultural practices described represent production operations and materials considered typical for a well managed farm in the 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, 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.**

Farm. The hypothetical farm consists of 100 contiguous acres farmed by the owner. Smaller non-contiguous parcels may have additional costs for travel time and equipment re-calibration. Larger farms will have increased efficiencies and lower per acre costs. Almonds are being established on 95 acres; roads, irrigation systems and farmstead occupy five acres.

Establishment Cultural Practices and Material Inputs

Site Preparation. The orchard is planted on land not previously planted to a tree crop. Land preparation begins with ripping in two directions, two to three feet deep, to break up underlying compaction. The ground is disced two times and then leveled to provide for winter drainage. All operations that prepare the orchard for planting are done in the year prior to planting, but costs are shown in the first year. The ripping and leveling operations are done by a custom operator.

Trees. No specific almond variety is planted in this study. Almond orchards will include at least two or more varieties in which pollen shedding and bloom periods' overlap to insure adequate pollination. 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 spacing). The life of the orchard at the time of planting is estimated to be 25 years.

Plant. The trees are planted in February. Prior to planting, the trees are treated for crown gall prevention by spraying the roots with a galltrol mixture. Two men spray the trees at the rate of 500 trees per gallon (one galltrol plate). A commercial planting crew marks the tree sites with a small stake, then plants, whitewashes, wraps, tops and stakes the trees. Costs are not included for the wraps, because they are furnished free by the nursery. For tree support, the trees are trellised and the cost includes custom installation, the tree ties and tying the trees. Staking is another option for tree support, but may have potentially higher costs. In the second year, 1% of the orchard or approximately one tree per acre will be replanted.

Train/Prune. Pruning begins in the first year when newly planted trees are topped by the planting crew and is included in the planting costs. In early summer of that year, the trees are suckered and the cost is included with the winter training and pruning. Training and pruning are done annually in the winter (December) through the fifth year. In the second year, some summer pruning and/or sucker removal may occur, but is not included as a cost in this study. Beginning in the sixth year, winter pruning is done in alternate years and one-half the cost is allocated to each year. Prunings in the first year are placed in the row middles and shredded with the regular mowing. Beginning in the second year, the prunings are pushed to the edge of the orchard and burned.

Winter Sanitation. In January of the fourth year and subsequent years, the mummy nuts are shaken from the trees and blown into the row middles for shredding. A custom operator shakes and blows the mummies, which are shredded by the grower.

Fertilize. Nitrogen fertilizer as dry Urea is applied by hand within the drip line of the tree during the first two years. From the third year to the fifth year, liquid UN-32 is applied through the irrigation system in equal amounts in April and July. In the sixth year equal amounts are applied in April, May and July. Costs to apply the fertilizer are assumed to be included in the irrigation labor. Annual rates of actual nitrogen (N) applied are shown in Table A. Beginning in the fall of the second year, zinc sulfate is applied as a foliar spray. In the sixth and subsequent years, potassium sulfate is banded along the tree row in the fall (November). Starting in the sixth year, one sample per 25 acres, leaves are collected annually in July for tree nutrition analysis.

Table A. Applied Nitrogen (N)

Year	Pounds of N/Acre
1	15
2	30
3	60
4	120
5	160
6+	220

Irrigate. In this study, the electrical cost for pumping well water is calculated to cost $56.04 per acre-foot or $4.67 per acre inch. Price per acre-foot of water will vary by grower depending on water source – well or district water, well characteristics, and water district. It is assumed soil water from rainfall will supply a portion of the early season water requirements. The field is irrigated an average of once per week from April to October. Amounts will vary each year depending upon the environment. The average water applied to an almond orchard is shown in Table B**.**

Table B. Total Applied Water

Year	AcIn/Year
1-2	18
3	26
4	32
5+	38

*Frost Protection***.** Frost protection begins in February or March of the fourth year and assumes two acre-inches of water will be applied annually. Frost protection may not be required every year and the amount of protection needed will vary. In this study, frost protection occurs in February.

Pollinate. A commercial beekeeper sets out one-half hive per acre in the third year, one hive in the fourth year, two hives in the fifth year and two and one-half hives in the sixth year. Bee colony strength should be a minimum of 6 to 8 frames of bees per hive.

Pest Management. The pesticides and rates mentioned in this cost study as well as other materials available are listed in *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.

*Weeds***.** In the first year, weeds are controlled in the row middles with two discings, one in May and one in June. The tree row (strip spray) is sprayed with Roundup in April, June, and August. In the second calendar year a dormant strip spray using Surflan and Roundup is applied in January. The row middles are mowed twice - February and June. Two spot or strip sprays with Roundup are applied to the tree row, one in April and one in July. From the third year on, the row middles are mowed five times, and a dormant season strip spray with Surflan, Goal, and Roundup is applied in January. Roundup is applied as a strip spray in May to pickup escaped weeds. In addition, a preharvest weed spray in July with Roundup is applied to the entire orchard floor (row middles and tree row).

*Insects***.** In the first year, sprays are applied using a sprayer with a handgun. An insecticide treatment of Lorsban for peach twig borer (PTB) control and AgriMek for mites is made in May. Due to the small tree size, the applied rate is 10% of recommended total volume. Starting in the second year an airblast sprayer is used to apply the materials. Assuming complete coverage is achieved, Imidan, and dormant oil are applied on alternate rows in January of the second year. For PTB in the fourth, fifth and sixth year, a biological insecticide, Dipel, is

added to the brown rot materials; two treatments are made, one at bloom in February and one at petal fall in early March.

Diseases. In the third, fourth and fifth years, Rovral is applied in February to control brown rot. In the fourth and fifth year, Ziram is applied in March to control shothole. In the sixth year, brownrot is controlled with Vangard in February and shothole with Rovral in early March, and Ziram in late March. Abound is applied in April for scab control.

Vertebrate Pests. In the spring of the first year, a tractor and bait applicator is used to apply poison bait for gopher control. Spot treatments are made using the ATV to move around the field and distribute the bait during the following years. Treatments will vary depending upon rodent populations. For this study, the application in March takes 0.13 hours per acre and one-pound of bait per acre. This decreases to 0.11 hours in the second year and 0.8 hours in the third and following years. It is assumed the gopher population is under control by the third year and only spot treatments are necessary. Ground squirrels are managed using anti-coagulant bait stations on the field perimeter beginning in the fourth year and are maintained during April, May, June, September and October. Bait stations can be homemade from PVC pipe or various size stations purchased. Costs for the stations can range from $5 to $35. For this study we assume the grower constructed 15 PVC bait stations at a cost of $5 per station and the costs are included in the Shop/Field Tools under Non-Cash Overhead. The bait stations are placed on two sides of the field approximately 300 feet apart. The grower uses an ATV to check the stations and fill with bait. The bait stations are checked weekly using the ATV and each month takes approximately 0.04 hours per acre and 0.15 pounds of bait. Rates and times for bait control are estimated and not based on any specific data.

Table C. Annual Yields Per Acre

Year	Kernel (meat)Pounds
3	400
4	800
5	1,400
6	2,000
7	2,200

Harvest. The crop is harvested by hand using rubber mallets and poles in the third year. The almonds are knocked to the ground, mechanically swept and hand raked to the centers, then mechanically picked up and hauled to the huller. In the following years, the crop is mechanically shaken, swept, and picked up.

Production Cultural Practices and Material Inputs

Winter Sanitation. Winter sanitation in January destroys overwintering sites for navel orangeworm (NOW). The trees containing mummy nuts are poled or mechanically shaken to drop the mummies to the orchard floor where they are blown into the middles and shredded with a flail mower. The shaking and blowing operations are custom hired and the grower does the shredding.

Prune. Hand pruning is done in alternate years during the winter months (December). In this study, one-half of the cost is charged each year to the orchard operation. Prunings are placed into the row middles and pushed out of the orchard by a tractor with a brush rake and burned.

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.

Pollinate. For maximum pollination, mature orchards require two and one-half hives (6 – 8 frames of bees per hive) per acre for pollination during February through mid-March.

Irrigate. Irrigation costs include pumping (water) and labor costs. The water is pumped from a well and passes through a filtration system into the low volume sprinkler system. Thirty-eight acre inches of water are applied to the orchard from April to October averaging one irrigation per week over the 25 week period. Irrigations early and late in the season may be less than once per week, while during the summer period the irrigations will exceed once per week. Water costs or pumping costs are $4.67 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.

Frost Protection. Frost protection may be needed in some years, usually in February and/or March. Two acre inches are applied for protection in February.

Fertilize. UN-32 is applied through the irrigation system at 220 pounds of N per acre and is split into equal applications in April, May and July. Potassium sulfate at 500 pounds per acre is banded along the tree row in late November. Also, in November zinc sulfate is applied as a foliar spray. Tree nitrogen status is determined by leaf analysis. One sample per 25 acres is collected in July using the ATV to move through the orchard. The leaf collecting is assumed to take .025 hours per acre and packaging 0.01 hours per acre.

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 www.ipm.ucdavis.edu. Written recommendations are required for many pesticides and are made by licensed pest control advisors. 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). 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. A private Crop Consultant is hired in this study.

Weeds. In this study, weeds in mature orchards are controlled in the tree row (strip spray) in the winter (January) using Surflan, Goal and Roundup. Also one strip spray with Roundup is made during May. Row middles are mowed five times (February, April, May, June, August) to control resident vegetation. To prepare the orchard floor for harvest, a herbicide application of Roundup is made in late July. The grower uses an ATV and pull sprayer for spraying the herbicides.

Insects and Mites. Several insect and mite pests are controlled each year using integrated pest management. It is assumed that biological insecticides such as Dipel applied at bloom and post bloom will control peach twig borer (PTB), therefore dormant sprays are not needed. The materials are applied with the disease sprays in early to late March. An insecticide application of Lorsban for navel orange worm (NOW) and Omite for mites is applied in July. This spray may not be done every year, other insecticides and timings may be utilized depending upon insect type and timing.

Diseases. Four fungicide applications are made to control brown rot, shothole, scab, and anthracnose. Applications for brownrot control are made with Vangard during bloom in February. Rovral is applied at petal fall for shothole in March and Ziram later in March. Abound is applied in April or later for additional diseases. Alternate fungicides with different modes of action should be used to protect against chemical resistance. See *Efficacy and Timing of Fungicides, Bactericides, and Biologicals for Deciduous Tree Fruit, Nut Crops, and Grapevines* at http://ipm.ucdavis.edu/PDF/PMG/fungicideefficacytiming.pdf .

Vertebrate Pests. Gophers are baited in March. The grower uses the ATV to move around the field and distribute the bait where needed. It takes about 0.8 hours per acre to cover the field. Ground squirrels are managed using anti-coagulant bait stations on the field perimeter. For this study we assume the grower constructed 15 PVC traps at a cost of $5 per trap and the costs are included in the Shop/Field Tools under Non-Cash Overhead. The traps are placed on two sides of the field approximately 300 feet apart. The grower uses an ATV to check the traps and apply the baits. The bait stations are checked weekly from April, May, June, September and October using the ATV and taking approximately 0.04 hours per acre per month and 0.15 pounds of bait. See the Vertebrate paragraph in the Establishment Section for further assumptions.

Harvest. A farm of this size may own their own harvesting equipment, but in this study the grower contracts to have the almond crop custom harvested. The grower furnishes labor for hand raking to move nuts missed by the sweeper into the windrows. Harvest is in August. A shaker head attaches to the tree trunk to shake the nuts from the tree. The nuts fall to the ground, allowed to dry and in a separate operation are blown from around the tree and swept into windrows. 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 for delivery to the huller.

Yields and Returns. Typical annual yields for almonds are measured in pounds of kernels (meats) per acre and are shown in Table C. Returns are $1.78 per meat pound, which is the USDA five year average (2001-2005) for California grower returns. In this study, the almonds are sold for $1.75 per pound. Yields will vary by location, grower, year, and age of orchard; for this study, it is assumed the well managed orchard will average 2,200 pounds over the remaining life. A range of returns and yields are shown in the Ranging Analysis in Table 6.

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 9,500 miles per year for the pickup. The ATV is used for weed spraying, baiting squirrels and gophers and is included in those costs. Additional ATV uses for checking the orchard, diseases and irrigation system are shown as a line item. The travel is estimated and not taken from any specific data.

Labor, Equipment, and Interest

Labor. Hourly wages for workers are $10.50 for machine operators and $7.50 per hour non-machine labor. Adding 38% for the employer's share of federal and state payroll taxes, workers compensation insurance, for nut crops and other possible benefits gives the labor rates shown of $14.49 and $10.35 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, 2005 (California Department of Insurance). Labor for operations involving machinery are 20% higher than the operation time given in Table 3 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 $2.00 and $2.55 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 3 is determined by multiplying the total hourly operating cost in Table 8 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 9.25% 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 2006.

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. These costs include property taxes, interest on operating capital, office expense, liability and property insurance, sanitation services, and equipment repairs.

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 0.70% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs $529 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, road maintenance, and miscellaneous farm expense.

Sanitation Services. Sanitation services provide portable toilets and washing facilities for the orchard and cost the farm $560 annually. This cost includes delivery and four months of weekly toilet service.

Management Salary. Wages for management are not included as a cash cost. Any return above total costs is considered a return to management.

Non-Cash Overhead

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

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

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery (tractors and implements) the remaining value is a percentage of the new cost of the investment (Boehlje and Eidman). The percent remaining value is calculated from equations developed by the American Society of Agricultural Engineers (ASAE) based on equipment type and years of life. The life in years is estimated by dividing the wearout life, as given by ASAE by the annual hours of use in this operation. For other investments including irrigation systems, buildings, and miscellaneous equipment, the value at the end of its useful life is zero. The salvage value for land is the purchase price because land does not depreciate. The purchase price and salvage value for equipment and investments are shown in Table 7.

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 6.25% 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 2006.

Land. Crop or bare land values range from $3,000 to $6,500. The orchard site is assumed to be on previously farmed open agricultural ground and in this study is valued at $5,500 per acre.

Irrigation System. The pump and well cost is based on one 75 horsepower electric pump lifting 36 acre-inches from a water level depth of 75 feet. The pump and 300-foot deep well already existed on the site, and the cost of the irrigation system is for the recasing of the well, refurbishment of the pump. The sprinkler system costs include the installation of a new filtration system and micro sprinklers. Water is pumped through the filtration station into micro sprinkler system or low volume irrigation system. The life of both irrigation systems is estimated to be 25 years. The irrigation system is considered an improvement and is shown in the non-cash overhead sections of the tables and the investment portion of Table 7.

Establishment Cost. Costs to establish the orchard are used to determine the non-cash overhead expenses, capital recovery, and interest on investment for the production years. The establishment cost is the sum of cash costs for land preparation, planting, trees, production expenses, and cash overhead for growing almond trees through the first year nuts are harvested less returns from production. The *Accumulated Net Cash Cost* in the third year shown in Table 1 represents the establishment cost per acre. For this study, this cost is $3,355 per acre or $318,725 for the 95-acre orchard. Establishment cost is amortized beginning in the fourth year over the remaining 22 years of production. Tree replacement or repairs is $3.18 per acre based on 0.10% of the establishment cost.

Equipment. Farm equipment is purchased new or used, but the study shows the current purchase price for new equipment. The new purchase price is adjusted to 60% to indicate a mix of new and used equipment. Annual ownership costs for equipment and other investments are shown in Table 7. 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.

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Table 1. SAMPLE COSTS TO ESTABLISH AN ALMOND ORCHARD

SACRAMENTO VALLEY 2006

	Cost Per Acre					
Year:	1st	2nd	3rd	4th	5th	6th
Meat Pounds Per Acre:			400	800	1,400	2,000
Planting Costs:						
Land Preparation: Subsoil 2X 3' depth (Custom)	200					
Land Preparation: Disc 2X	13					
Land Preparation: Laser Level 2X (Custom)	200					
Plant: Mark, Dip, Plant, Top, Whitewash, Wrap Trees	321	3				
Plant: Trees, 124 Per Acre (1% Replant In 2nd Year)	651	5				
Plant: Tree Support (Stakes or Trellis)	225					
TOTAL PLANTING COSTS	1,611	8				
Cultural Costs:						
Vertebrate: Gopher (Bait)	9	5	3	3	3	3
Fertilize N (Yr 1-2, 46-0-0. Yr 3+, UN32)	15	22	30	60	80	110
Weed: Disk 2X	13					
Irrigate: (water + labor)	106	106	144	174	202	202
Weed: Inseason Strip Spray (Roundup) (Yr 1, 3X. Yr 2, 2X. Yr 3+, 1X)*	34	23	11	11	11	11
Prune and/or Train and/or Sucker (Yr 6+ done in alternate years)	41	36	33	33	33	44
Insect: PTB (Yr 1, Lorsban. Yr 2, Imidan, Oil). Mites (Yr 1, AgriMek)	23	42				
PCA: PCA/Consultant Service	5	5	5	5	30	30
Pickup Truck Use	87	87	87	87	87	87
ATV Truck Use	41	41	41	41	41	41
Weed: Winter Strip (Yr 2, Surflan, Roundup. Yr 3+, Surflan, Goal, Roundup)		50	104	104	104	104
Weed: Mow (Yr 2, 2X. Yr 3+, 5X)		13	33	33	33	33
Fertilize: Zinc (foliar)		11	14	23	23	23
Prune: Push & Burn (Yr 6, alternate years)		5	37	42	42	41
Pollination: Hives			70	140	280	350
Disease: Brown Rot (Rovral).			37			
Weed: Orchard Floor (Roundup) Preharvest			18	18	18	18
Disease: Brownrot (Rovral) Insect: PTB (Dipel)				51	53	53
Disease: Shothole (Ziram) Insect: PTB (Dipel)				47	49	49
Irrigate: Frost Protection				13	13	13
Vertebrate: Squirrel (Bait)				7	7	7
Fertilize: Leaf Samples for NPK (ATV, labor, analysis)				2	2	2
Winter Sanitation: Knock Mummies, Blow, Rake, Shred)				142	142	142
Disease: Scab (Abound)						49
Disease: Brown Rot (Vangard)						32
Insect: Worm/Mite (Lorsban/Omite) Hull Split						96
Fertilize: Potassium Sulfate						118
TOTAL CULTURAL COSTS	376	446	667	1,037	1,254	1,659
Harvest Costs:						
Pole Trees			31			
Shake Trees				80	80	80
Sweep Nuts			55	55	55	55
Hand Rake			5	5	10	13
Pick Up and Haul			21	56	98	140
Hull & Shell Nuts			18	48	84	120
TOTAL HARVEST COSTS			130	244	327	408
Interest On Operating Capital @ 9.25%	175	26	17	36	45	60
TOTAL OPERATING COSTS/ACRE	2,161	480	815	1,317	1,626	2,127

UC COOPERATIVE EXTENSION

Table 1. CONTINUED

SACRAMENTO VALLEY 2006

	Cost Per Acre					
Year:	1st	2nd	3rd	4th	5th	6th
Meat Pounds Per Acre:			400	800	1,400	2,000
Cash Overhead Costs:						
Office Expense	50	50	50	50	50	50
Liability Insurance	6	6	6	6	6	6
Sanitation Fees	6	6	6	6	6	6
Environmental/Safety Training	1	1	1	1	1	1
Property Taxes	75	75	75	75	75	75
Property Insurance	12	12	12	12	12	12
Investment Repairs	50	50	50	50	50	50
TOTAL CASH OVERHEAD COSTS	199	200	200	200	200	200
TOTAL CASH COSTS/ACRE	2,361	680	1,014	1,516	1,826	2,327
INCOME/ACRE FROM PRODUCTION			700	1,400	2,450	3,500
NET CASH COSTS/ACRE FOR THE YEAR	2,361	680	314	116		
PROFIT/ACRE ABOVE CASH COSTS					624	1,173
ACCUMULATED NET CASH COSTS/ACRE	2,361	3,041	**3,355**	3,471	2,847	1,674
Non-Cash Overhead Costs (Capital Recovery):						
Buildings 2400 sqft	75	75	75	75	75	75
Land	362	362	362	362	362	362
Fuel Tanks 2-500 gal	6	6	6	6	6	6
Shop/Field Tools/Equipment	17	17	17	17	17	17
Pump Refurbished	15	15	15	15	15	15
Micro-Sprinkler Irrigation System	100	100	100	100	100	100
Equipment	78	81	81	81	81	87
TOTAL NON-CASH OVERHEAD COST/ACRE	652	656	656	656	656	662
TOTAL COST/ACRE FOR THE YEAR	3,013	1,336	1,670	2,172	2,482	2,989
INCOME/ACRE FROM PRODUCTION			700	1,400	2,450	3,500
TOTAL NET COST/ACRE FOR THE YEAR	3,013	1,336	970	772	32	
NET PROFIT/ACRE ABOVE TOTAL COST						511
TOTAL ACCUMULATED NET COST/ACRE	3,013	4,349	5,318	6,091	6,122	5,611

* Spray is either solid strip spray or spot spray depending on weed population.

UC COOPERATIVE EXTENSION

Table 2. MATERIALS AND CUSTOM WORK COSTS PER ACRE - ESTABLISHMENT YEARS

SACRAMENTO VALLEY - 2006

			Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
							Total Per Acre							
OPERATING COSTS	Unit	$/Unit	units	$	units	$	units	$	units	$	units	$	units	$
Custom:														
Consultant Fee (PCA)	acre	5.00	1.00	5	1.00	5	1.00	5	1.00	5				
Consultant Fee (PCA)	acre	30.00									1.00	30	1.00	30
Subsoil 2X, 2-3 ft	acre	200.00	1.00	200										
Laser Level 2X	acre	200.00	1.00	200										
Mark, Plant, Top, Wrap Trees	each	2.50	124.00	310	1.00	3								
Tree Support	acre	225.00	1.00	225										
Leaf Analysis: NPK	each	30.00							0.04	1	0.04	1	0.04	1
Pollination: Hives	each	140.00					0.50	70	1.00	140	2.00	280	2.50	350
Shake Trees (nuts & mummies)	hour	80.00							2.00	160	2.00	160	2.00	160
Sweep (nuts & mummies)	hour	55.00					1.00	55	2.00	110	2.00	110	2.00	110
Pickup Nuts	lb	0.05					300.00	15	800.00	40	1,400.00	70	2,000.00	100
Haul Nuts	lb	0.02					300.00	6	800.00	16	1,400.00	28	2,000.00	40
Hull & Shell Nuts	lb	0.06					300.00	18	800.00	48	1,400.00	84	2,000.00	120
Tree/Tree Aids:														
Tree: Almond	tree	5.25	124.00	651	1.00	5								
Irrigation:														
Water - Pumped	acin	4.67	18.00	84	18.00	84	26.00	121	34.00	159	40.00	187	40.00	187
Fertilizer:														
Zinc Sulfate 36%	lb	0.45			15.00	7	20.00	9	30.00	14	30.00	14	30.00	14
Potassium Sulfate (0-0-50)	lb	0.23											500.00	115
46-0-0 (Urea)	lb N	0.48	15.00	7	30.00	14								
UN-32	lb N	0.50					60.00	30	120.00	60	160.00	80	220.00	110
Herbicide:														
Goal 2 XL	pint	16.45					3.00	49	3.00	49	3.00	49	3.00	49
Surflan 4AS	pint	14.52			2.70	39	3.00	44	3.00	44	3.00	44	3.00	44
Roundup Ultra Max	pint	8.58	2.25	19	2.22	19	2.97	25	2.97	25	2.97	25	2.97	25
Insecticide:														
Agri-Mek 0.15EC	floz	6.10	1.50	9										
Omite 30W	lb	8.23											7.50	62
Dormant Oil	gal	3.83			2.00	8								
Imidan 70W (WSP)	lb	12.39			2.40	30								
Galltrol A Plates	each	36.92	0.25	9										
Lorsban 4E	pint	6.29	0.60	4									4.00	25
Dipel DF	lb	14.54							2.00	29	2.00	29	2.00	29
Fungicide:														
Rovral 4F	pint	29.06					1.00	29	1.00	29	1.00	29	1.00	29
Ziram WDG 76	lb	3.15							8.00	25	8.00	25	8.00	25
Vangard WG	oz	4.52											5.00	23
Abound 2EC	floz	2.78											14.00	39
Rodenticide:														
Gopher Bait Wilco	lb	4.94	1.00	5	0.50	2	0.25	1	0.25	1	0.25	1	0.25	1
Squirrel Wilco	lb	4.00							0.75	3	0.75	3	0.75	3
Labor (machine)	hrs	14.49	8.79	127	8.29	120	9.23	134	10.22	148	10.37	150	11.56	168
Labor (non-machine)	hrs	10.35	7.11	74	6.41	66	11.86	123	9.91	103	10.41	108	11.72	121
Fuel - Gas	gal	2.55	10.82	28	10.93	28	10.91	28	11.13	28	11.13	28	11.13	28
Fuel - Diesel	gal	2.00	4.86	10	3.02	6	5.84	12	7.95	16	8.39	17	11.88	24
Lube				6		5		6		7		7		8
Machinery repair				14		13		18		21		22		27
Interest @ 9.25%				175		26		17		36		45		60
TOTAL				2,161		480		815		1,317		1,626		2,127

Year 7: See Table 4

UC COOPERATIVE EXTENSION

Table 3. COSTS PER ACRE TO PRODUCE ALMONDS

SACRAMENTO VALLEY - 2006

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per acre: Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent	Total Cost	Your Cost
Cultural:							
Weed: Dormant Strip (Goal, Surflan, Roundup)	0.23	4	1	99	0	104	
Winter Sanitation: Shake Mummies, Rake, Sweep, Shred	0.21	4	3	0	135	142	
PCA: PCA/Crop Consultant Fees	0.00	0	0	0	30	30	
Disease: Brown Rot (Vangard)	0.31	5	4	23	0	32	
Weed: Mow Middles 5X	1.03	18	15	0	0	33	
Pollination: Bee Hives	0.00	0	0	0	350	350	
Irrigation: Frost Protection	0.36	4	0	9	0	13	
Disease: Shothole (Rovral). Insect: PTB (Dipel)	0.31	5	4	44	0	53	
Disease: Shothole (Ziram). Insect: PTB (Dipel)	0.31	5	4	40	0	49	
Vertebrate: Gopher (Bait) Spot Treat	0.08	1	0	1	0	3	
Disease: Scab (Abound)	0.31	5	4	39	0	49	
Fertilize: through sprinkler system (UN32)	0.00	0	0	110	0	110	
Irrigation: (water & labor)	2.34	24	0	177	0	202	
Vertebrate: Squirrel (bait)	0.20	3	0	3	0	7	
Weed: Strip or Spot Spray (Roundup)	0.23	4	1	6	0	11	
Fertilize: Collect Leaf Samples 1/25 acres (ATV & analysis)	0.03	1	0	0	1	2	
Insect: Mite (Omite), NOW (Lorsban)	0.31	5	4	87	0	96	
Weed: Orchard Floor (Roundup) Preharvest preparation	0.23	4	1	13	0	18	
Fertilize: Band Along Tree Row (Potassium Sulfate)	0.11	2	2	115	0	118	
Fertilize: Foliar (Zinc)	0.31	5	4	14	0	23	
Prune: Alternate Years (1/2 cost shown)	4.26	44	0	0	0	44	
Prune: Brush Disposal (Push & Burn) Alternate Years	0.17	39	2	0	0	41	
Pickup Truck Ranch Use	3.25	57	30	0	0	87	
ATV: General Use	2.00	35	7	0	0	41	
TOTAL CULTURAL COSTS	16.59	276	87	780	516	1,659	
Harvest:							
Shake	0.00	0	0	0	80	80	
Hand Rake Nuts	1.25	13	0	0	0	13	
Sweep	0.00	0	0	0	55	55	
Pickup and Haul Nuts	0.00	0	0	0	154	154	
Hull and Shell Nuts	0.00	0	0	0	132	132	
TOTAL HARVEST COSTS	1.25	13	0	0	421	434	
Interest on operating capital @ 9.25%						53	
TOTAL OPERATING COSTS/ACRE		289	87	780	937	2,145	
CASH OVERHEAD:							
Office Expense						50	
Liability Insurance						6	
Sanitation Fees						6	
Environmental & Safety Costs						1	
Property Taxes						92	
Property Insurance						24	
Investment Repairs						53	
TOTAL CASH OVERHEAD COSTS						232	
TOTAL CASH COSTS/ACRE						2,377	

Non-cash Overhead (Capital Recovery) Investment	Per producing Acre	Annual Cost Capital Recovery	
Buildings	842	75	75
Land	5,789	362	362
Fuel Tanks 2-500g	69	6	6
Shop & Field Tools	158	17	17
Sprinkler Irrigation System	1,250	100	100
Pump Refurbished	189	15	15
Orchard Establishment Costs	3,355	285	285
Equipment	831	87	87
TOTAL NON-CASH OVERHEAD COSTS	12,483	946	946
TOTAL COSTS/ACRE			3,324

UC COOPERATIVE EXTENSION

Table 4. COSTS AND RETURNS PER ACRE TO PRODUCE ALMONDS

SACRAMENTO VALLEY - 2006

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Almonds	2,200.00	lb	1.75	3,850	
OPERATING COSTS					
Insecticide:					
Dipel DF	2.00	lb	14.54	29	
Lorsban 4E	4.00	pint	6.29	25	
Omite 30W	7.50	lb	8.23	62	
Fungicide:					
Rovral 4 Flowable	1.00	pint	29.06	29	
Ziram WDG 76	8.00	lb	3.15	25	
Abound	14.00	floz	2.78	39	
Vangard WG	5.00	oz	4.52	23	
Rodenticide:					
Gopher Bait	0.25	lb	4.94	1	
Squirrel Bait	0.75	lb	4.00	3	
Herbicide:					
Roundup Ultra Max	2.97	pint	8.58	25	
Goal 2 XL	3.00	pint	16.45	49	
Surflan AS	3.00	pint	14.52	44	
Fertilizer:					
UN-32	220.00	lb N	0.50	110	
Zinc Sulfate 36%	30.00	lb	0.45	14	
Potassium Sulfate (0-0-50)	500.00	lb	0.23	115	
Irrigation:					
Water - Pumped (Pumping cost)	38.00	acin	4.67	177	
Water - Pumped (Frost Protection)	2.00	acin	4.67	9	
Custom/Contract:					
Hives (Pollination)	2.50	hives	140.00	350	
Leaf Analysis: NPK (1 sample/25 acres)	0.04	each	30.00	1	
PCA/Crop Consultant Fee	1.00	acre	30.00	30	
Shake Trees	2.00	hour	80.00	160	
Sweep Nuts	2.00	hour	55.00	110	
Pickup Nuts	2,200.00	lb	0.05	110	
Haul Nuts	2,200.00	lb	0.02	44	
Hull & Shell Nuts	2,200.00	lb	0.06	132	
Labor (machine)	11.56	hrs	14.49	168	
Labor (non-machine)	11.72	hrs	10.35	121	
Fuel - Gas	11.13	gal	2.55	28	
Fuel - Diesel	11.88	gal	2.00	24	
Lube				8	
Machinery repair				27	
Interest on operating capital @ 9.25%				53	
TOTAL OPERATING COSTS/ACRE				2,146	
NET RETURNS ABOVE OPERATING COSTS				1,704	

UC COOPERATIVE EXTENSION

Table 4. CONTINUED

SACRAMENTO VALLEY 2006

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
CASH OVERHEAD COSTS:					
Office Expense				50	
Liability Insurance				6	
Sanitation Fees				6	
Environmental & Safety Costs				1	
Property Taxes				92	
Property Insurance				24	
Investment Repairs				53	
TOTAL CASH OVERHEAD COSTS/ACRE				232	
TOTAL CASH COSTS/ACRE				2,377	
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Buildings				75	
Land				362	
Fuel Tanks 2-500g				6	
Shop & Field Tools				17	
Sprinkler Irrigation System				100	
Pump Refurbished				15	
Orchard Establishment Costs				285	
Equipment				87	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				946	
TOTAL COSTS/ACRE				3,324	
NET RETURNS ABOVE TOTAL COSTS				526	

UC COOPERATIVE EXTENSION

Table 5. MONTHLY CASH COSTS - ALMONDS

SACRAMENTO VALLEY - 2006

Beginning JAN 06 Ending DEC 06	JAN 06	FEB 06	MAR 06	APR 06	MAY 06	JUN 06	JUL 06	AUG 06	SEP 06	OCT 06	NOV 06	DEC 06	TOTAL
Cultural:													
Weed: Dormant Strip (Goal, Surflan, Roundup)	104												104
Winter Sanitation: Shake Mummies, Rake, Sweep, Shred	142												142
PCA: PCA/Crop Consultant Fees		10			10				10				30
Disease: Brown Rot (Vangard)		32											32
Weed: Mow Middles 5X		7		7	7	7		7					33
Pollination: Bee Hives		350											350
Irrigation: Frost Protection		13											13
Disease: Shothole (Rovral). Insect: PTB (Dipel)			53										53
Disease: Shothole (Ziram). Insect: PTB (Dipel)			49										49
Vertebrate: Gopher (Bait) Spot Treat			3										3
Disease: Scab (Abound)				49									49
Fertilize: through sprinkler system (UN32)				37	37		37						110
Irrigation: (water & labor)				20	25	37	43	35	25	16			202
Vertebrate: Squirrel (bait)				1	1	1			1	1			7
Weed: Strip or Spot Spray (Roundup)					11								11
Fertilize: Collect Leaf Samples 1/25 acres (ATV & analysis)							2						2
Insect: Mite (Omite), NOW (Lorsban)							96						96
Weed: Orchard Floor (Roundup) Preharvest preparation							18						18
Fertilize: Band Along Tree Row (Potassium Sulfate)											118		118
Fertilize: Foliar (Zinc)											23		23
Prune: Alternate Years (1/2 cost shown)												44	44
Prune: Brush Disposal (Push & Burn) Alternate Years												41	41
Pickup Truck Ranch Use	7	7	7	7	7	7	7	7	7	7	7	7	87
ATV: General Use	3	3	3	3	3	3	3	3	3	3	3	3	42
TOTAL CULTURAL COSTS	256	422	116	124	102	55	207	53	47	28	152	96	1,659
Harvest:													
Shake								80					80
Hand Rake Nuts								13					13
Sweep								55					55
Pickup and Haul Nuts								154					154
Hull and Shell Nuts								132					132
TOTAL HARVEST COSTS								434	0	0	0	0	434
Interest on operating capital @ 9.25%	2	5	6	7	8	8	10	14	-2	-2	-2	-1	53
TOTAL OPERATING COSTS/ACRE	258	428	122	131	110	64	217	500	45	26	150	95	2,145

UC COOPERATIVE EXTENSION

Table 5. CONTINUED

SACRAMENTO VALLEY - 2006

Beginning JAN 06 Ending DEC 06	JAN 06	FEB 06	MAR 06	APR 06	MAY 06	JUN 06	JUL 06	AUG 06	SEP 06	OCT 06	NOV 06	DEC 06	TOTAL
CASH OVERHEAD:													
Office Expense	4	4	4	4	4	4	4	4	4	4	4	4	50
Liability Insurance	6												6
Sanitation Fees		6											6
Environmental & Safety Costs	0	0	0	0	0	0	0	0	0	0	0	0	1
Property Taxes				46								46	92
Property Insurance	24												24
Investment Repairs	4	4	4	4	4	4	4	4	4	4	4	4	54
TOTAL CASH OVERHEAD COSTS	38	15	9	55	9	9	9	9	9	9	9	55	232
TOTAL CASH COSTS/ACRE	297	442	131	186	118	72	225	509	54	35	159	150	2,377

UC COOPERATIVE EXTENSION
Table 6. RANGING ANALYSIS
SACRAMENTO VALLEY- 2006

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	1,659	1,659	1,659	1,659	1,659	1,659	1,659
Harvest Cost	276	316	355	394	434	473	513
Interest on operating capital @ 9.25%	52	52	52	53	53	53	53
TOTAL OPERATING COSTS/ACRE	1,987	2,027	2,066	2,106	2,146	2,185	2,225
TOTAL OPERATING COSTS/LB	1.42	1.27	1.15	1.05	0.98	0.91	0.86
CASH Overhead Costs/ACRE	232	232	232	232	232	232	232
TOTAL CASH COSTS/ACRE	2,219	2,259	2,298	2,338	2,378	2,417	2,457
TOTAL CASH COSTS/LB	1.58	1.41	1.28	1.17	1.08	1.01	0.94
NON-CASH Overhead Costs/ACRE	946	946	946	946	946	946	946
TOTAL COSTS/ACRE	3,165	3,205	3,244	3,284	3,324	3,363	3,403
TOTAL COSTS/LB	2.26	2.00	1.80	1.64	1.51	1.40	1.31

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE	YIELD (lb/acre)						
$/lb	1,400	1,600	1,800	2,000	2,200	2,400	2,600
1.00	-587	-427	-266	-106	54	215	375
1.25	-237	-27	184	394	604	815	1,025
1.50	113	373	634	894	1,154	1,415	1,675
1.75	463	773	1,084	1,394	1,704	2,015	2,325
2.00	813	1,173	1,534	1,894	2,254	2,615	2,975
2.25	1,163	1,573	1,984	2,394	2,804	3,215	3,625
2.50	1,513	1,973	2,434	2,894	3,354	3,815	4,275

NET RETURNS PER ACRE ABOVE CASH COSTS

PRICE	YIELD (lb/acre)						
$/lb	1,400	1,600	1,800	2,000	2,200	2,400	2,600
1.00	-819	-659	-498	-338	-178	-17	143
1.25	-469	-259	-48	162	372	583	793
1.50	-119	141	402	662	922	1,183	1,443
1.75	231	541	852	1,162	1,472	1,783	2,093
2.00	581	941	1,302	1,662	2,022	2,383	2,743
2.25	931	1,341	1,752	2,162	2,572	2,983	3,393
2.50	1,281	1,741	2,202	2,662	3,122	3,583	4,043

NET RETURNS PER ACRE ABOVE TOTAL COSTS

PRICE	YIELD (lb/acre)						
$/lb	1,400	1,600	1,800	2,000	2,200	2,400	2,600
1.00	-1,765	-1,605	-1,444	-1,284	-1,124	-963	-803
1.25	-1,415	-1,205	-994	-784	-574	-363	-153
1.50	-1,065	-805	-544	-284	-24	237	497
1.75	-715	-405	-94	216	526	837	1,147
2.00	-365	-5	356	716	1,076	1,437	1,797
2.25	-15	395	806	1,216	1,626	2,037	2,447
2.50	335	795	1,256	1,716	2,176	2,637	3,097

UC COOOPERATIVE EXTENSION

Table 7. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS

SACRAMENTO VALLEY - 2006

ANNUAL EQUIPMENT COSTS

					Cash Overhead		
Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur-ance	Taxes	Total
06	66 HP 2WD Tractor	46,230	20	5,932	3,956	183	261	4,399
06	ATV 4WD	5,790	7	2,196	787	28	40	855
06	Brush Rake 9 ft	2,000	25	57	159	7	10	177
06	Front end Loader	5,000	15	480	503	19	27	550
06	Mower - Flail 10 ft	10,500	10	1,857	1,304	43	62	1,409
06	Orchard Sprayer 500 gal	21,000	15	2,016	2,113	81	115	2,308
06	Pickup 1/2 ton	26,000	7	9,863	3,533	126	179	3,838
06	Spin/Spreader-Pull	11,000	20	573	963	41	58	1,062
06	Weed Sprayer 100 gal	4,000	10	707	497	16	24	537
TOTAL		131,520		23,681	13,815	543	776	15,134
60% of New Cost*		78,912		14,209	8,289	326	466	9,081

*Used to reflect a mix of new and used equipment

ANNUAL INVESTMENT COSTS

					Cash Overhead			
Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur-ance	Taxes	Repairs	Total
INVESTMENT								
Orchard Establishment	318,725	22		27,047	1,116	1,594	318	30,074
Buildings, 2400 sqft	80,000	20		7,117	280	400	1,600	9,397
Irrigation: Low Volume Sprinkler	118,750	25		9,511	416	594	2,375	12,896
Irrigation: Pump 75HP & Well Refurbished	18,000	25		1,442	63	90	360	1,955
Fuel Tanks 2-500g	6,514	20	651	562	25	36	130	753
Land	550,000	25	550,000	34,375	0	5,500	0	39,875
Shop & Field Tools/Equipment	15,000	15		1,570	53	75	300	1,997
TOTAL INVESTMENT	1,106,989		550,651	81,624	1,952	8,288	5,083	96,947

ANNUAL BUSINESS OVERHEAD COSTS

Description	*Units/ Farm	Unit	Price/ Unit	Total Cost
Environmental & Safety Costs	95	acre	1	95
Liability Insurance	95	acre	5.57	529
Office Expense	95	acre	50.00	4,750
Sanitation Fees	95	acre	5.89	560

*Units = producing acres

UC COOPERATIVE EXTENSION

Table 8. HOURLY EQUIPMENT COSTS

SACRAMENTO VALLEY - 2006

			COSTS PER HOUR						
				Cash Overhead		Operating			
Yr	Description	Actual Hours Used	Capital Recovery	Insur-ance	Taxes	Repairs	Fuel & Lube	Total Oper.	Total Costs/Hr.
06	66 HP 2WD Tractor	353.70	6.71	0.31	0.44	1.87	7.34	9.21	16.67
06	ATV 4WD	285.20	1.66	0.06	0.08	0.43	2.93	3.36	5.16
06	Brush Rake 9 ft	16.10	5.91	0.27	0.38	0.27	0.00	0.27	6.83
06	Front end Loader	16.10	18.69	0.71	1.02	0.70	0.00	0.70	21.12
06	Mower - Flail 10 ft	117.40	6.66	0.22	0.32	4.34	0.00	4.34	11.54
06	Orchard Sprayer 500 gal	177.80	7.13	0.27	0.39	3.21	0.00	3.21	11.00
06	Pickup 1/2 ton	308.80	6.87	0.24	0.35	1.91	7.33	9.24	16.70
06	Spin/Spreader-Pull	10.20	56.89	2.39	3.42	4.04	0.00	4.04	66.74
06	Weed Sprayer 100 gal	65.80	4.53	0.15	0.21	1.07	0.00	1.07	5.96

UC COOPERATIVE EXTENSION

Table 9. OPERATIONS WITH EQUIPMENT & MATERIALS

SACRAMENTO VALLEY - 2006

Operation	Operation Month	Equipment Tractor	Implement	Non-Mach Labor hrs/acre	Material	Broadcast Rate/acre	Unit
Cultural:							
Weed: Dormant Strip	Dec	ATV	Weed Sprayer		Surflan	3.00	pt
					Goal	3.00	pt
					Roundup	0.72	pt
Winter Sanitation	Jan	Custom			Shake	1.00	hr
		Custom			Sweep/Blow	1.00	hr
		66HP 2WD	Mower-Flail				
Disease: Brown Rot	Feb	66HP 2WD	Orchard Sprayer		Vangard	5.00	oz
Disease: Shothole. Insect: PTB	Mar	66HP 2WD	Orchard Sprayer		Rovral	1.00	pt
					Dipel	1.00	lb
	Mar	66HP 2WD	Orchard Sprayer		Ziram	8.00	lb
					Dipel	1.00	lb
Disease: Scab & other diseases	Apr	66HP 2WD	Orchard Sprayer		Abound	14.00	floz
Weed: Mow Middles 5X	Feb	66HP 2WD	Mower-Flail				
	Apr	66HP 2WD	Mower-Flail				
	May	66HP 2WD	Mower-Flail				
	June	66HP 2WD	Mower-Flail				
	July	66HP 2WD	Mower-Flail				
Pollinate: Bee Hives	Feb	Custom			Hives	2.50	acre
Irrigate: Frost Protection	Feb			0.36	Water	2.00	acin
Irrigate: (water & labor)	April			0.18	Water	3.89	acin
	May			0.36	Water	4.58	acin
	June			0.45	Water	6.64	acin
	July			0.63	Water	7.86	acin
	Aug			0.36	Water	6.77	acin
	Sept			0.18	Water	5.00	acin
	Oct			0.09	Water	3.26	acin
Vertebrate: Gopher	Mar	ATV			Bait	0.25	lb
Vertebrate: Squirrel	April	ATV			Bait	0.15	lb
	May	ATV			Bait	0.15	lb
	June	ATV			Bait	0.15	lb
	Sept	ATV			Bait	0.15	lb
	Oct	ATV			Bait	0.15	lb
Fertilize: Nitrogen through irrigation	Apr				UN32	73.34	lb N
	May				UN32	73.33	lb N
	July				UN32	73.33	lb N
Fertilize: Leaf Samples Collected	July	ATV		0.08	Analysis	0.04	acre
Weed: Strip Spray	May	ATV	Weed Sprayer		Roundup	0.75	pt
Insect: Mite/NOW	July	66HP 2WD	Orchard Sprayer		Omite	7.50	lb
					Lorsban	4.00	pt
Weed: Spray Middles Preharvest	July	ATV	Weed Sprayer		Roundup	1.50	pt
Harvest: Shake	Aug	Custom			Shake	1.00	hr
Harvest: Hand Rake	Aug			1.25			
Harvest: Sweep	Aug	Custom			Sweep	1.00	hr
Harvest: Pickup & Haul	Aug	Custom			Pickup	2,200.00	lb
					Haul	2,200.00	lb
Harvest: Hull & Shell	Aug	Custom			Hull & Shell	2,200.00	lb
Fertilize: Potassium	Nov	66HP 2WD	Spin Spreader		Potassium	500.00	lb
Fertilize: Zinc	Nov	66HP 2WD	Orchard Sprayer		Zinc	30.00	lb
Prune: Hand (Alternate Years)	Dec			4.30			
Prune: Brush Push & Burn (Alternate Years)	Dec	66HP 2WD	Front End Loader Brush Rake				