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UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2003

SAMPLE COSTS TO ESTABLISH  
AN ALMOND ORCHARD AND PRODUCE

# ALMONDS



SAN JOAQUIN VALLEY SOUTH  
FLOOD IRRIGATION

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 SAMPLE COSTS TO ESTABLISH an ALMOND ORCHARD  
 and PRODUCE ALMONDS  
 San Joaquin Valley South - 2003  
 Flood Irrigation

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**INTRODUCTION**

Sample costs to establish an almond orchard and produce almonds under flood irrigation in the Southern San Joaquin Valley are presented in this study. This study is intended as a guide only, and can be used to make production decisions, determine potential returns, prepare budgets and evaluate production loans. Practices described are based on 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 are available and can be requested through the Department of Agricultural and Resource Economics, UC Davis, (530) 752-4424. Current studies can be downloaded from the department website <http://coststudies.ucdavis.edu> or obtained from the local county UC Cooperative Extension offices. Some archived studies are also available on the website.

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## ASSUMPTIONS

The assumptions refer to Tables 1 to 8 and pertain to sample costs to establish an orchard (Table 1) and produce almonds (Tables 2-8) in the Southern San Joaquin Valley under flood irrigation. Practices described represent production practices and materials considered typical of a well-managed orchard in the region. The costs, materials, and practices shown in this study will not apply to all situations. Establishment and production cultural practices vary by grower and the differences can be significant. **The use of trade names and cultural practices in this report does not constitute an endorsement or recommendation by the University of California nor is any criticism implied by omission of other similar products or cultural practices.**

**Land.** The hypothetical farm consists of 105 contiguous acres farmed by the owner. Almond establishment and production are on 100 acres. Road, irrigation systems and farmstead occupy five acres.

### Establishment Operating Costs

**Site Preparation.** The new orchard is planted (established) on land previously planted to an orchard. The land is assumed to be well drained and either a class I or II soil with a Storie index above 70%.

*Orchard Removal.* In October the trees are pushed over and then chipped. This is followed by orchard cleanup – stump removal and root removal. Orchard removal fees vary considerably. The lowest fees appear to be those in conjunction with cogeneration plants, where the plant keeps and grinds the wood.

*Land Preparation.* The tree row is slip plowed one time to break up layered or compacted soil. The row middles are ripped one time to a five-foot depth. The land is disked four times in different directions, laser leveled, and the tree row fumigated. Custom operators do all operations, including fumigation, to prepare the orchard for planting in the year prior to planting, but costs are shown in the first year.

**Planting.** In February, contract labor companies who specialize in orchard planting do the planting operation. They survey, dig (auger) the planting holes, plant, prune, spray trees with bactericide, and place a tree guard around the trunk. The tree guards protect against above ground rodents, herbicide sprays, and sunburn. In the second year, one tree per acre is replanted.

**Trees.** The Nonpareil almond variety and two other suitable pollinators are planted at 110 trees per acre on a 22 X 18-foot spacing. Almond orchards will include at least two or more varieties in which pollen shedding and bloom periods overlap to insure good pollination. Planting densities may range from 75 to 180 trees per acre. In the high-density or closer plantings (greater than 130 trees per acre), more intensive management is needed to prevent excessive insect and disease problems. The life of the orchard at the time of planting is estimated to be 22 to 25 years.

**Fertilization.** Leaf samples are taken in June/July for nutrient analysis and the fertilizers applied according to analysis recommendations. Fertilizer rates in this study are typical nutrient requirements, but do not take into account soil and water nitrogen.

Year:	1	2	3	4	5	6+
	lbs/acre					
N:	20	40	100	140	200	240

In the first and second years, four equally split applications of nitrogen (N) as ammonium nitrate (33.5-0-0) are made in March, May, June, and September. The fertilizer is hand applied near the base of the trees (approximately 18-inches from the trunk). Beginning in the third year, the four equal applications of N are applied along the tree drip line using a fertilizer applicator. Zinc chelate is applied in May and September during the first and second year. The May sprays are combined with the mite sprays in the first and second years. Annual rates of actual N used in this study are shown in Table A. Beginning in the fifth year, boron (Solubor) is foliar applied on the trees in October.

**Training/Pruning.** Suckering is done by grower labor twice (April and May) in the first year and once (May) in the second year. Training which includes pruning begins in December of the first year or January of the second year. In this study, pruning begins in the second year. A labor contractor does the pruning and tying each year. A custom or contract operator pushes the prunings out of the orchard, stacks and burns them. Pruning is heavier in the fourth year than in the past, because of the lower limbs that were left during the three previous seasons, resulting in higher pushing and burning costs.

**Winter Sanitation.** Winter (December) sanitation begins in the third year. In this study a minimal cost for hand poling is allocated in the third year and beginning in the fourth year, the costs include a custom operator who shakes the mummy nuts from the trees, and blows and rakes them into the row middles where the grower shreds them.

**Pollination.** A commercial beekeeper sets out 1/2 hive per acre in the third year, 2 hives per acre in the fourth year, 3 hives per acre from the fifth year and thereafter. The hives are placed in the orchard in early February, prior to bloom.

**Irrigation.** After planting, two irrigation furrows are made on each side of the tree row. Irrigation begins in mid-March and continues through mid- November. Berms are made in the third year and the field is flood irrigated approximately every 12 to 16 days. Water is pumped from a reservoir, and delivered to the orchard through an underground pipe and alfalfa valve system. In this study pumping and water costs \$10.50 per acre-inch. No assumption is made about effective rainfall. The amount of water applied each year is shown in Table B.

Table B. Applied Water

Year	AcIn/Yr
1	20
2	30
3	40
4	50
5+	62

**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* available online at [www.imp.ucdavis.edu](http://www.imp.ucdavis.edu) . Pesticides mentioned in the study are commonly used, but are not recommendations.

**Weeds.** The row middles are disked six times – March, April, May, June, July, and August – during the first two years. Roundup is applied to the tree row in March, May, July, and September. In the third year, berms are made in February after the first disking, the row middles leveled and rolled. The resident vegetation is allowed to grow and is mowed nine times – April, May, June, July, and August and in subsequent years 10 times beginning in March. Roundup is applied on the berms (tree row) in May and July in the third year and as a spot spray in the fourth and subsequent years. Beginning in the third year, Roundup is applied to the entire orchard floor in August prior to harvest. A dormant strip spray with Surflan and Goal is applied beginning in the December of the third year (or January of the fourth year).

*Insects.* In May of the first year, peach twig borer is controlled with Diazinon. Beginning in the second year, a dormant spray in January or early February with Supreme Oil and Asana controls peach twig borer (PTB), San Jose scale (SJS), and brown almond and European red mites. In May of the second year and May of the third year, mites are controlled with an Agrimek and Supreme Oil application. Beginning in late June/July of the third year, ant bait (Clinch or Distance) is broadcast on the field for ant control. In some cases the baits have not worked well, therefore an application of Lorsban may be necessary. Navel orange worms (NOW) and mites are treated in June (hull split spray) with Imidan and Omite. The sprays are applied with a handgun that is attached to the sprayer. It is assumed that one person drives the tractor that pulls the sprayer and one person sprays the trees with the handgun, both labor costs are included in the application costs. Label rates may be reduced during the first three years, because of the small tree size.

*Diseases.* Beginning in the fourth year, brown rot is treated at full bloom with Rovral. Shot Hole, Botrytis (Green Fruit Rot) and Scab are treated two to three weeks later – mid-March - with Ziram and Vanguard. Alternaria and rust may be a problem in some areas, but not every year and is not included as a cost in the study.

*Vertebrates.* Gophers in this study are managed in the first three years with poison bait applied in the spring and fall using a hand bait applicator. Beginning in the fourth year, gophers are controlled in the spring with gopher bait and ground squirrels in the late spring with an anti-coagulant squirrel bait. Squirrels may also be controlled with a late winter fumigation when soil moisture is adequate.

**Harvest.** Mechanical harvesting and pickup by a custom operator begins in the third year. The nuts are removed from the trees by shaking, moved to the centers by sweeping and hand raking, picked up and transported to a hulling and shelling facility.

Year	Kernel Pounds
3	600
4	1,200
5	2,400
6	2,600
7+	2,800

*Yields and Returns.* Almonds begin bearing an economic crop in the third year after planting. Typical annual yields for almonds are measured in meat (kernel) pounds per acre and are shown in Table C.

### Production Operating Costs

**Winter Sanitation.** Winter (January) sanitation destroys over-wintering sites for navel orange worm. A custom operator shakes the mummy nuts from the trees, and blows and rakes them into the row middles where the grower shreds them. Some hand poling is included in the cost but may often be needed in low rainfall years and costs can range from \$80 to \$400 per acre depending on the number of mummy nuts. Some growers may pole the nuts at harvest after shaking to include the nuts in the yield and reduce poling costs to remove mummy nuts.

**Pruning.** Hand pruning is done by contract labor in December, but can be done anytime after harvest through the dormant period. The prunings are stacked in the row middles and a custom operator pushes them out of the orchard into a stack where they are burned. The practice of burning will change over the next few years due to new air pollution laws.

**Irrigation.** Water is pumped from a reservoir, through an underground pipeline to an alfalfa valve irrigation system. In this study water costs \$10.50 per acre-inch (\$126 per acre-foot) and includes the pumping cost from the reservoir. The irrigation costs includes the water and irrigation labor. A total of sixty-two acre-inches of water is applied to the orchard. Water costs in the San Joaquin Valley vary by water district and can cost the grower \$30 to \$200 per acre-foot. No assumption is made about effective rainfall, evaporation, and runoff.

**Frost Protection.** The resident vegetation is mowed in March. Also, when temperatures drop below freezing during or after bloom, water will be applied to the field during these periods.

**Pollination.** Three hives (6-7 frames/hive) per acre are contracted for pollination and set in the orchard by the beekeeper prior to bloom.

**Fertilization.** Nitrogen as ammonium nitrate (33.5-0-0) at 240 pounds per acre is applied down the row along the tree drip line in equal amounts in March and July. The number of split applications will vary depending upon soil texture and may increase total application costs. In flood irrigation on sandy soils, more splits will provide greater benefits for tree nutrition and yield. Boron (Solubor) is foliar applied in October. Fertilizer rates in this study are typical nutrient requirements, but do not take into account soil and water nitrogen. Leaf samples are taken in June/July for nutrient analysis and the fertilizers applied according to analysis recommendations. Leaf samples in this study are calculated at one per 20 acres and analyzed for N, P, K, B, Zn, Na and Zn. The cost includes the labor to collect and prepare the samples and lab fees.

**Fall Defoliation.** Zinc sulfate is applied in mid-November, mainly to defoliate the tree. This also allows for early pruning and provides secondary control for rust and some diseases.

**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 above UC IPM website at [www.ipm.ucdavis.edu](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. Many pesticides require or suggest the use of various adjuvants, but these costs are not included in the study.

*Pest Control Adviser (PCA).* Written recommendations are required for many pesticides and are made by licensed pest control advisors. In addition the PCA will monitor the field for agronomic problems including pests and nutrition. Growers may hire private PCA's or receive the service as part of a service agreement with an agricultural chemical and fertilizer company. In this study, the grower hires a PCA for pest and nutrition advice and a PCA or irrigation specialist for irrigation advice.

*Weeds.* A dormant strip spray using pre/post-emergent herbicides (Goal, Surflan) to control weeds in the tree rows is applied in December/January. In March and July, a post emergent spot spray (Roundup) is applied on the berms (tree row). Resident species are grown as a ground cover in the middles and are mowed ten times (March through August). A preharvest weed spray (Roundup) in August is applied to the orchard floor.

*Insects.* A dormant spray of Supreme Oil and Asana in January or early February before bud swell controls peach twig borer, San Jose scale, bacterial blast and brown almond and European red mites. Ant bait (Clinch or Distance) is broadcast on the orchard floor in June for ant control. When baits have failed, a Lorsban application may be necessary two weeks prior to shaking. At the beginning of hull split in June, Imidan and Omite are applied to control navel orangeworm (NOW) and various mites, respectively. NOW can also be managed by early harvest and winter sanitation.

*Disease.* Rovral and 1% Supreme Oil are applied in February at bloom to control brown rot blossom blight. A second spray using Ziram and Vangard to control, shot hole, greenfruit or jacket rot, and scab is applied in mid-March at petal fall.

*Vertebrate Pest.* Poison bait is applied in the spring by a mechanical applicator for gopher control. Ground squirrels are controlled by the use of anti-coagulant baits with above ground bait stations in the spring. Late winter fumigation is also done when soil moisture is adequate.

**Harvest.** In this study, a custom operator mechanically harvests the almond crop. The operator shakes the nuts from the trees, sweep the nuts into a windrow, picks up the nuts and hauls them to the huller/sheller. The custom operator also furnishes hand labor to rake the nuts missed by the sweeper into the windrow. Harvest begins in August for the early maturing varieties and continues into October for late maturing varieties.

*Yields and Returns.* Typical annual yields for almonds are measured in meat (kernel) pounds per acre and are shown in Table C. An estimated price of a \$1.10 per pound based on 2002 average prices reported in the local Agricultural Commissioners Crop Reports is used in this study to determine potential profits/losses. Returns will vary depending on the market.

**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 4,500 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 monitoring the orchard and checking the irrigation system is shown under ATV and assumes the ATV travels 3,000 miles per year or 30 miles per acre.

**Labor.** Labor rates of \$13.70 per hour for machine operators and \$9.25 for general labor includes payroll overhead of 37%. The basic hourly wages are \$10.00 for machine operators and \$6.75 for general labor. The overhead includes the employers' share of federal and California state payroll taxes, workers' compensation insurance for orchard/nut crops (code 0045), and a percentage for other possible benefits. 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, 2003 (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 the American Society of Agricultural Engineers (ASAE). Fuel and lubrication costs are also determined by ASAE equations based on maximum PTO horsepower and fuel type. Prices for on-farm delivery of diesel and gasoline are \$1.11 and \$1.58 per gallon, respectively. The fuel prices are a January 2003 average based on four California delivery locations. The cost includes a 2.25% sales tax (effective September 2001) on diesel fuel and 7.25% sales tax on gasoline. Gasoline also includes federal and state excise tax, which can be refunded for on-farm use when filing your income tax. The fuel, lube, and repair cost per acre for each operation in the “Cost Per Acre to Produce” table is determined by multiplying the total hourly operating cost in the “Hourly Equipment Costs” table for each piece of equipment used from the Operation Time (Hrs/A) column by the hours per acre. Tractor time is 10% higher than implement time for a given operation to account for setup, travel and down time.

**Interest On Operating Capital.** Interest on operating capital is based on cash operating costs and is calculated monthly until harvest at a nominal rate of 7.14% per year. A nominal interest rate is the typical market cost of borrowed funds. The interest cost of post harvest operations is discounted back to the last harvest month using a negative interest charge.

**Risk.** Production risks should not be minimized. While this study makes every effort to model a production system based on typical, real world practices, it cannot fully represent financial, agronomic and market risks, which affect the profitability and economic viability of almond production.

### **Cash Overhead Costs**

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

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

**Insurance.** Insurance for farm investments varies depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.676% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$645 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.

**Sanitation Services.** Sanitation services provide single portable toilets and washbasins for the orchard and cost the farm \$112 per month. The monthly service charge is an average of four to six California sanitation companies and locations. The cost includes delivery and 2 months of weekly service.



**Safety Training/Equipment.** An estimated cost to cover safety-training workshops, record keeping and related materials for employees. Also, includes safety equipment such as respirators for spraying, coveralls, eyewash stations and related materials.

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

**Investment Repairs.** Annual maintenance is calculated as two percent of the purchase price.

### **Non-Cash Overhead 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 the tables.

*Capital Recovery Factor.* Capital recovery factor is the amortization factor or annual payment whose present value at compound interest is 1. The amortization factor is a table value that corresponds to the interest rate used and the life of the machine.

*Interest Rate.* The interest rate of 6.25% used to calculate capital recovery cost is the USDA-ERS's ten-year average of California's agricultural sector long-run rate of return to production assets from current income. It is used to reflect the long-term realized rate of return to these specialized resources that can only be used effectively in the agricultural sector.

**Establishment Cost.** Costs to establish the orchard are used to determine capital recovery expenses, depreciation, and interest on investment for the production years. Establishment cost is the sum of the costs for land preparation, planting, trees, cash overhead and production expenses for growing the trees through the first year that 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 \$4,523 per acre or \$452,300 for the 100-acre orchard. The establishment cost is spread over the remaining 22 years of the 25 years the orchard is in production.

**Irrigation System.** The alfalfa valve irrigation system consists of underground lines configured to that the irrigation runs do not exceed one-quarter mile. A pump and reservoir are already installed from the previous orchard and is not accounted for in this study. The water flows into the reservoir from the district and is pumped from the reservoir into the system.

**Land.** Land values for open or cropland range from \$2,400 to \$3,500 per acre. Land in this study is valued at \$3,000 per acre or \$3,150 per producing acre. Land with producing almond orchards ranges from \$4,000 to \$8,000 per acre.

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

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

**Fuel Tanks.** Two 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 Tables 3 and 8. 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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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. SAMPLE COSTS TO ESTABLISH AN ALMOND ORCHARD**  
 SAN JOAQUIN VALLEY - SOUTH 2003

	Cost Per Acre					
	Year:	1st	2nd	3rd	4th	5th
Meat Pounds Per Acre:				600	1,200	2,400
<b>Planting Costs:</b>						
Orchard Removal		125				
Orchard Removal Field Cleanup		140				
Land Preparation - Slip Plow Tree Row		240				
Land Preparation - Subsoil Row Middles		150				
Land Preparation - Disc 4X		52				
Land Preparation - Laser Level		200				
Land Preparation - Fumigate Tree Row (Telone)		200				
Mark, Plant, Dip Trees, Prune, Trunk Guards		192	5			
Trees: 110 Per Acre (1% Replant In 2nd Year)		522	5			
<b>TOTAL PLANTING COSTS</b>		<b>1,821</b>	<b>10</b>			
<b>Cultural Costs:</b>						
Training, Pruning, & Suckering	33		81	94	123	159
Stack and Burn Prunings			15	24	35	25
Winter Sanitation				30	138	149
Make Irrigation Furrows	3		3			
Make Berms				15		
Insect - Ants				13	13	13
Insect - Dormant (Asana, Oil)			*45	42	42	42
Insect - PTB (Diazinon)/Fertilize (Zinc)	15					
Insect - Mite (Agrimek)/Fertilize - (Zinc)	54		94			
Insect - Mite (Agrimek)				88		
Insect - Mite (Omite) - NOW (Imidan)				106	106	106
Disease - Shothole/Scab (Vangard, Ziram)					63	63
Disease - Brown Rot (Rovral)					34	34
Pollination				28	110	165
Irrigate	254		359	462	567	737
Vertebrate - Rodents (Bait)	10		19	19	23	23
Fertilizer - Nitrogen (ammonium nitrate)	17		24	45	60	82
Fertilizer - (Zinc)	14		14			
Fertilizer - Solubor (Boron)						10
Weed - Dormant Strip (Surflan, Goal)				66	66	66
Weed - Disc 6X, 6X, 1X	26		26	5		
Weed - Mow 9X, 10X, 10X				45	52	52
Weed - Spot Spray Tree Rows 2X (Roundup)					23	23
Weed - Tree Row 4X, 4X, 2X (Roundup)	55		55	28		
Weed - Preharvest Spray Orchard Floor (Roundup)				17	17	17
Weed - Float/Roll Middles				10		
Defoliate (Zinc Sulfate)			*24	21	21	21
Pest Control Adviser	30		30	30	30	30
Pickup Truck Use	33		33	33	33	33
ATV (use not included in above operations)	19		19	19	19	19
Leaf Analysis	2		2	2	2	2
<b>TOTAL CULTURAL COSTS</b>		<b>565</b>	<b>843</b>	<b>1,242</b>	<b>1,577</b>	<b>1,871</b>
<b>Harvest Costs:</b>						
Shake, Rake, Sweep, Haul				110	218	218
Hull Nuts				36	72	144
<b>TOTAL HARVEST COSTS</b>				<b>146</b>	<b>290</b>	<b>362</b>
Interest On Operating Capital @ 7.40%	107		16	21	26	33
<b>TOTAL OPERATING COSTS/ACRE</b>		<b>2,493</b>	<b>869</b>	<b>1,409</b>	<b>1,893</b>	<b>2,266</b>

\*includes handgun operator

UC COOPERATIVE EXTENSION

Table 1. continued

	Cost Per Acre					
	Year:	1st	2nd	3rd	4th	5th
Meat Pounds Per Acre:				600	1,200	2,400
<b>Cash Overhead Costs:</b>						
Office Expense		50	50	50	50	50
Liability Insurance		6	6	6	6	6
Sanitation Fees		4	4	4	4	4
Safety Training and Equipment		5	5	5	5	5
Property Taxes		41	41	41	41	41
Property Insurance		6	6	7	6	6
Investment Repairs		25	25	25	25	25
<b>TOTAL CASH OVERHEAD COSTS</b>		<b>137</b>	<b>137</b>	<b>138</b>	<b>137</b>	<b>137</b>
<b>TOTAL CASH COSTS/ACRE</b>		<b>2,630</b>	<b>1,006</b>	<b>1,547</b>	<b>2,030</b>	<b>2,403</b>
<b>INCOME/ACRE FROM PRODUCTION</b>				<b>660</b>	<b>1,320</b>	<b>2,640</b>
<b>NET CASH COSTS/ACRE FOR THE YEAR</b>		<b>2,630</b>	<b>1,006</b>	<b>887</b>	<b>710</b>	
<b>PROFIT/ACRE ABOVE CASH COSTS</b>						<b>237</b>
<b>ACCUMULATED NET CASH COSTS/ACRE</b>		<b>2,630</b>	<b>3,636</b>	<b>4,523</b>	<b>5,233</b>	<b>4,996</b>
<b>Non-Cash Overhead Costs:</b>						
<b>Capital Recovery Cost:</b>						
Building		45	45	45	45	45
Land		197	197	197	197	197
Fuel Tanks		6	6	6	6	6
Shop Tools		11	11	11	11	11
Alfalfa Valve Irrigation System		36	36	36	36	36
Equipment		57	57	70	62	62
<b>TOTAL NON-CASH OVERHEAD COST/ACRE</b>		<b>352</b>	<b>352</b>	<b>365</b>	<b>357</b>	<b>357</b>
<b>TOTAL COST/ACRE FOR THE YEAR</b>		<b>2,982</b>	<b>1,358</b>	<b>1,912</b>	<b>2,387</b>	<b>2,760</b>
<b>INCOME/ACRE FROM PRODUCTION</b>				<b>660</b>	<b>1,320</b>	<b>2,640</b>
<b>TOTAL NET COST/ACRE FOR THE YEAR</b>		<b>2,982</b>	<b>1,358</b>	<b>1,252</b>	<b>1,067</b>	<b>120</b>
<b>NET PROFIT/ACRE ABOVE TOTAL COST</b>						
<b>TOTAL ACCUMULATED NET COST/ACRE</b>		<b>2,982</b>	<b>4,340</b>	<b>5,592</b>	<b>6,659</b>	<b>6,779</b>

UC COOPERATIVE EXTENSION  
**Table 2. COSTS PER ACRE TO PRODUCE ALMONDS**  
 SAN JOAQUIN VALLEY - SOUTH 2003

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per acre				Total Cost	Your Cost
		Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent		
<b>Cultural:</b>							
Prune/Tie- Dormant	0.00	0	0	0	208	208	
Push, Stack, Burn Prunings	0.00	0	0	0	25	25	
Irrigate	4.50	42	0	651	0	693	
Pest-Gopher (Gopher Bait)	0.01	0	0	9	0	10	
Pest-Gopher (Squirrel Bait)	0.01	0	0	13	0	13	
Pest-Ants (Clinch or Distance)	0.01	0	0	13	0	13	
Pest-Disease: Brown Rot (Rovral)	0.31	5	3	27	0	34	
Pest-Disease: ShotHole (Vanguard/Ziram)	0.31	5	3	55	0	63	
Pest-Dormant (Asana, Oil)	0.31	5	3	34	0	42	
Pest-Mite (Omite) -NOW (Imidan)	0.31	5	3	98	0	106	
Fertilize N (Ammonium Nitrate)	0.15	3	1	89	0	93	
Fertilize Boron (Solubor)	0.31	5	3	2	0	10	
Remove Leaves (ZnSO4)	0.31	5	3	13	0	21	
Fertilize-Leaf Samples 1/20ac	0.05	0	0	0	2	2	
Weed-Mow 10X	2.08	34	18	0	0	52	
Weed-Spot Spray (Roundup)	0.23	4	1	18	0	23	
Weed-Preharvest, Spray Orchard Floor (Roundup)	0.23	4	2	11	0	17	
Weed-Dormant (Surflan Goal) Tree Row	0.23	4	1	62	0	66	
Pollination	0.00	0	0	0	165	165	
Winter Sanitation- Shake, Rake, Shred	0.17	3	1	0	145	149	
Pest Control Advisers	0.00	0	0	0	30	30	
Pickup	1.50	25	9	0	0	33	
ATV	1.00	16	2	0	0	19	
<b>TOTAL CULTURAL COSTS</b>	<b>12.06</b>	<b>165</b>	<b>51</b>	<b>1,095</b>	<b>574</b>	<b>1,886</b>	
<b>Harvest:</b>							
Harvest-Shake, Rake, Sweep, Haul	0	0	0	0	238	238	
Harvest-Hull/Shell	0	0	0	0	168	168	
<b>TOTAL HARVEST COSTS</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>406</b>	<b>406</b>	
Interest on operating capital @ 7.14%						35	
<b>TOTAL OPERATING COSTS/ACRE</b>		<b>165</b>	<b>51</b>	<b>1,095</b>	<b>980</b>	<b>2,327</b>	
<b>CASH OVERHEAD:</b>							
Office Expense						50	
Liability Insurance						6	
Sanitation Fee						4	
Safety Training/Equipment						5	
Property Taxes						64	
Property Insurance						22	
Investment Repairs						25	
<b>TOTAL CASH OVERHEAD COSTS</b>						<b>176</b>	
<b>TOTAL CASH COSTS/ACRE</b>						<b>2,503</b>	
<b>NON-CASH OVERHEAD:</b>							
		Per producing		Annual Cost			
		Acre		Capital Recovery			
Buildings		600		45		45	
Fuel Tanks		65		6		6	
Shop Tools		113		11		11	
Land		3,150		197		197	
Irrigation-Alfalfa Valve System		450		36		36	
Establishment Cost		4,523		384		384	
Equipment		559		62		62	
<b>TOTAL NON-CASH OVERHEAD COSTS</b>		<b>9,461</b>		<b>741</b>		<b>741</b>	
<b>TOTAL COSTS/ACRE</b>						<b>3,244</b>	

UC COOPERATIVE EXTENSION  
**Table 3. COSTS AND RETURNS PER ACRE TO PRODUCE ALMONDS**  
 SAN JOAQUIN VALLEY - SOUTH 2003

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
<b>GROSS RETURNS</b>					
Almonds	2,800.00	lb	1.10	3,080	
<b>OPERATING COSTS</b>					
<b>Custom:</b>					
Prune Trees	1.00	acre	183.00	183	
Tie Trees	1.00	acre	25.00	25	
Push/Burn Brush	1.00	acre	25.00	25	
Leaf Analysis 1/20 acre	1.00	acre	1.50	2	
Pollination Fee	3.00	hive	55.00	165	
Shake - Harvest/Winter Sanitation	2.00	acre	35.00	115	
Poling - Winter Sanitation	1.00	acre	80.00	80	
Sweep/Blow -Winter Sanitation	1.00	acre	25.00	25	
Rake- Hand - Harvest/Winter Sanitation	2.00	acre	5.00	10	
PCA Pest/Nutrition	1.00	acre	20.00	20	
PCA Irrigation Specialist	1.00	acre	10.00	10	
Sweep - Harvest	1.00	acre	43.00	43	
Pickup -Harvest	1.00	acre	55.00	55	
Haul - Harvest	1.00	acre	55.00	55	
Hull/Shell - Harvest	2,800.00	lb	0.06	168	
<b>Irrigation:</b>					
Water - District	62.00	acin	10.50	651	
<b>Rodenticide:</b>					
Gopher Bait Rozol	3.00	lb	3.09	9	
Squirrel Bait Rozol	3.00	lb	4.29	13	
<b>Insecticide:</b>					
Clinch	1.00	lb	13.19	13	
Asana XL	4.00	floz	1.04	4	
Volck Supreme Oil	6.00	gal	5.00	30	
Imidan 70 WSB	4.30	lb	9.00	39	
Omite 30-WS	7.50	lb	7.89	59	
<b>Fungicide:</b>					
Rovral 4F	1.00	pint	26.52	27	
Vanguard WG	7.50	oz	4.09	31	
Ziram WDG 76	8.00	lb	3.00	24	
<b>Fertilizer:</b>					
33.5-0-0 (Ammonium Nitrate)	240.00	lb N	0.37	89	
Boron (Solubor)	2.00	lb	0.98	2	
ZnS04 Solution 12% (Defoliant) (10 gallons)	108.00	lb	0.12	13	
<b>Herbicide:</b>					
Roundup Ultra Max	3.25	pint	9.20	30	
Surflan 4AS	2.16	pint	16.33	35	
Goal 2 XL	1.62	pint	16.35	26	
Labor (machine)	9.01	hrs	13.70	123	
Labor (non-machine)	4.55	hrs	9.25	42	
Fuel - Gas	5.25	gal	1.58	8	
Fuel - Diesel	15.81	gal	1.11	18	
Lube				4	
Machinery repair				21	
Interest on operating capital @ 7.14%				35	
<b>TOTAL OPERATING COSTS/ACRE</b>				<b>2,328</b>	
<b>NET RETURNS ABOVE OPERATING COSTS</b>				<b>752</b>	

UC COOPERATIVE EXTENSION

Table 3. continued

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
<b>CASH OVERHEAD:</b>					
Office Expense				50	
Liability Insurance				6	
Sanitation Fee				4	
Safety Training/Equipment				5	
Property Taxes				64	
Property Insurance				22	
Investment Repairs				25	
<b>TOTAL CASH OVERHEAD COSTS</b>				<b>176</b>	
<b>TOTAL CASH COSTS/ACRE</b>				<b>2,503</b>	
<b>NON-CASH OVERHEAD COSTS</b>					
Buildings				45	
Fuel Tanks				6	
Shop Tools				11	
Land				197	
Irrigation-Alfalfa Valve System				36	
Establishment Cost				384	
Equipment				62	
<b>TOTAL NON-CASH OVERHEAD COSTS</b>				<b>741</b>	
<b>TOTAL COSTS/ACRE</b>				<b>3,244</b>	
<b>NET RETURNS ABOVE TOTAL</b>				<b>-164</b>	



UC COOPERATIVE EXTENSION  
**Table 4. MONTHLY CASH COSTS - ALMONDS**  
 SAN JOAQUIN VALLEY - SOUTH 2003

Beginning JAN 03	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Ending DEC 03	03	03	03	03	03	03	03	03	03	03	03	03	
Cultural:													
Prune/Tie- Dormant	208												208
Push, Stack, Burn Prunings	25												25
Irrigate			17	58	84	119	140	90	109	53	22		693
Pest-Rodent (Gopher Bait)			10										10
Pest-Rodent (Squirrel Bait)					13								13
Pest-Ants (Clinch or Distance)						13							13
Pest-Disease: Brown Rot (Rovral)		34											34
Pest-Disease: ShotHole (Vanguard/Ziram)			63										63
Pest-Dormant (Asana, Oil)	42												42
Pest-Mite (Omite) -NOW (Imidan)						106							106
Fertilize N (33.5-0-0, Ammonium Nitrate)			47				47						93
Fertilize Boron (Solubor)										10			10
Remove Leaves (ZnSO4)											21		21
Fertilize-Leaf Samples 1/20ac						2							2
Weed-Mow 10X			5	10	10	10	10	5					52
Weed-Spot Spray (Roundup)			11				11						23
Weed-Preharvest (Roundup)								17					17
Weed-Dormant (Surflan Goal) Tree Row												66	66
Pollination		165											165
Winter Sanitation- Shake, Rake, Shred												149	149
Pest Control Advisers	3	3	3	3	3	3	3	3	3	3	3	3	30
Pickup	3	3	3	3	3	3	3	3	3	3	3	3	33
ATV	2	2	2	2	2	2	2	2	2	2	2	2	19
<b>TOTAL CULTURAL COSTS</b>	<b>282</b>	<b>206</b>	<b>159</b>	<b>75</b>	<b>114</b>	<b>258</b>	<b>215</b>	<b>119</b>	<b>116</b>	<b>70</b>	<b>50</b>	<b>222</b>	<b>1,886</b>
Harvest:													
Harvest-Shake, Rake, Sweep, Haul									238				238
Harvest-Hull/Shell									168				168
<b>TOTAL HARVEST COSTS</b>									<b>406</b>				<b>406</b>
Interest on operating capital	2	3	4	4	5	7	8	11	-3	-2	-2	-1	35
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>284</b>	<b>209</b>	<b>163</b>	<b>79</b>	<b>119</b>	<b>264</b>	<b>223</b>	<b>536</b>	<b>114</b>	<b>68</b>	<b>48</b>	<b>221</b>	<b>2,328</b>
OVERHEAD:													
Office Expense	4	4	4	4	4	4	4	4	4	4	4	4	50
Liability Insurance								6					6
Sanitation Fee	0	0	0	0	0	0	0	0	0	0	0	0	4
Safety Training/Equipment	0	0	0	0	0	0	0	0	0	0	0	0	5
Property Taxes	32						32						64
Property Insurance	11						11						22
Investment Repairs	2	2	2	2	2	2	2	2	2	2	2	2	25
<b>TOTAL CASH OVERHEAD COSTS</b>	<b>50</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>50</b>	<b>13</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>176</b>
<b>TOTAL CASH COSTS/ACRE</b>	<b>333</b>	<b>216</b>	<b>170</b>	<b>86</b>	<b>126</b>	<b>271</b>	<b>273</b>	<b>549</b>	<b>121</b>	<b>75</b>	<b>55</b>	<b>228</b>	<b>2,503</b>

UC COOPERATIVE EXTENSION  
**Table 5. RANGING ANALYSIS**  
 SAN JOAQUIN VALLEY - SOUTH 2003

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE ALMONDS

	YIELD (lb/acre)						
	2,000	2,200	2,400	2,600	2,800	3,000	3,200
<b>OPERATING COSTS/ACRE:</b>							
Cultural Cost	1,885	1,885	1,885	1,885	1,885	1,885	1,885
Harvest Cost	327	346	366	386	406	426	446
Interest on operating capital	34	34	35	35	35	35	35
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>2,246</b>	<b>2,265</b>	<b>2,286</b>	<b>2,306</b>	<b>2,326</b>	<b>2,346</b>	<b>2,366</b>
Total Operating Costs/lb	1.12	1.03	0.95	0.89	0.83	0.78	0.74
<b>CASH OVERHEAD COSTS/ACRE</b>							
<b>TOTAL CASH COSTS/ACRE</b>	<b>2,422</b>	<b>2,441</b>	<b>2,462</b>	<b>2,482</b>	<b>2,502</b>	<b>2,522</b>	<b>2,542</b>
Total Cash Costs/lb	1.21	1.11	1.03	0.95	0.89	0.84	0.79
<b>NON-CASH OVERHEAD COSTS/ACRE</b>							
<b>TOTAL COSTS/ACRE</b>	<b>3,163</b>	<b>3,182</b>	<b>3,203</b>	<b>3,223</b>	<b>3,243</b>	<b>3,263</b>	<b>3,283</b>
Total Costs/lb	1.58	1.45	1.33	1.24	1.16	1.09	1.03

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE	YIELD (lb/acre)						
	2,000	2,200	2,400	2,600	2,800	3,000	3,200
\$ /lb							
0.80	-646	-505	-366	-226	-86	54	194
0.90	-446	-285	-126	34	194	354	514
1.00	-246	-65	114	294	474	654	834
1.10	-46	155	354	554	754	954	1,154
1.20	154	375	594	814	1,034	1,254	1,474
1.30	354	595	834	1,074	1,314	1,554	1,794
1.40	554	815	1,074	1,334	1,594	1,854	2,114

NET RETURN PER ACRE ABOVE CASH COST

PRICE	YIELD (lb/acre)						
	2,000	2,200	2,400	2,600	2,800	3,000	3,200
\$ /lb							
0.80	-822	-681	-542	-402	-262	-122	18
0.90	-622	-461	-302	-142	18	178	338
1.00	-422	-241	-62	118	298	478	658
1.10	-222	-21	178	378	578	778	978
1.20	-22	199	418	638	858	1,078	1,298
1.30	178	419	658	898	1,138	1,378	1,618
1.40	378	639	898	1,158	1,418	1,678	1,938

NET RETURNS PER ACRE ABOVE TOTAL COST

PRICE	YIELD (lb/acre)						
	2,000	2,200	2,400	2,600	2,800	3,000	3,200
\$ /lb							
0.80	-1,563	-1,422	-1,283	-1,143	-1,003	-863	-723
0.90	-1,363	-1,202	-1,043	-883	-723	-563	-403
1.00	-1,163	-982	-803	-623	-443	-263	-83
1.10	-963	-762	-563	-363	-163	37	237
1.20	-763	-542	-323	-103	117	337	557
1.30	-563	-322	-83	157	397	637	877
1.40	-363	-102	157	417	677	937	1,197

UC COOPERATIVE EXTENSION  
**Table 6. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS**  
 SAN JOAQUIN VALLEY - SOUTH 2003

ANNUAL EQUIPMENT COSTS

Yr Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
					Insur- ance	Taxes	
03 66 HP 2WD Tractor	29,708	20	3,812	2,542	113	168	2,823
03 ATV 4WD	5,790	7	2,196	787	27	40	854
03 Mower/Chopper - 8'	6,713	10	1,187	834	27	40	900
03 Orchard PTO .Sprayer 500 gal	19,741	15	1,895	1,986	73	108	2,167
03 Pickup 1/2 ton	16,500	7	1,650	2,787	61	91	2,939
03 Spin/Spreader - Pull	10,593	20	552	928	38	53	1,030
03 Spot Sprayer 15 gal	225	10	40	28	1	1	30
03 Weed Sprayer 100 gal	3,947	10	698	490	16	23	529
<b>TOTAL</b>	<b>93,217</b>		<b>12,030</b>	<b>10,382</b>	<b>356</b>	<b>526</b>	<b>11,264</b>
60% of New Cost*	55,930		7,218	6,229	213	316	6,758

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

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insur- ance	Taxes	Repairs	
Buildings 2,400 sqft	60,000	30		4,476	203	300	1,200	6,179
Establishment Cost	452,300	22		38,382	1,529	2,262	0	42,172
Fuel Tanks 2-500g	6,514	20	651	562	24	36	130	752
Land	315,000	22	315,000	19,688	0	3,150	0	22,837
Shop Tools	11,330	15	1,133	1,138	42	62	226	1,468
Alfalfa Valve Irrigation System	45,000	25		3,604	152	225	900	4,881
<b>TOTAL INVESTMENT</b>	<b>890,144</b>		<b>316,784</b>	<b>67,850</b>	<b>1,950</b>	<b>6,035</b>	<b>2,456</b>	<b>78,291</b>

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	100	acre	6.45	645
Office Expense	100	acre	50.00	5,000
Safety Training/Equipment	100	acre	5.00	500
Sanitation (2 months)	100	acre	4.36	436

UC COOPERATIVE EXTENSION  
**Table 7. HOURLY EQUIPMENT COSTS**  
 SAN JOAQUIN VALLEY - SOUTH 2003

Yr Description	COSTS PER HOUR							Total Costs/Hr.
	Actual Hours Used	Cash Overhead			Operating		Total Oper.	
		Capital Recovery	Insur- ance	Taxes	Repairs	Fuel & Lube		
03 66 HP 2WD Tractor	490.20	3.11	0.14	0.21	1.20	4.07	5.27	8.72
03 ATV 4WD	149.90	3.15	0.11	0.16	0.43	1.82	2.25	5.66
03 Mower/Chopper - 8'	220.00	2.27	0.07	0.11	2.78	0.00	2.78	5.23
03 Orchard PTO .Sprayer 500 gal	187.20	6.37	0.23	0.35	3.02	0.00	3.02	9.96
03 Pickup 1/2 ton	150.00	11.15	0.25	0.36	1.21	4.54	5.75	17.51
03 Spin Spreader-Pull	15.40	36.67	1.40	2.07	3.89	0.00	3.89	44.03
03 Spot Sprayer 15 gal	23.00	0.73	0.02	0.03	0.06	0.00	0.06	0.85
03 Weed Sprayer 100 gal	46.20	6.37	0.20	0.30	1.06	0.00	1.06	7.93

UC COOPERATIVE EXTENSION  
**Table 8. OPERATIONS WITH EQUIPMENT**  
 SAN JOAQUIN VALLEY - SOUTH 2003

Operation	Month	Equipment		Material	Rate/acre*	Unit
		Tractor	Implement			
<b>Cultural:</b>						
Prune/Tie- Dormant	January	Custom				
Push, Stack, Burn Prunings	January	Custom				
Irrigate	March			Water 1X	1.39	acin
	April			Water 2X	4.96	acin
	May			Water 2X	7.47	acin
	June			Water 2X	10.83	acin
	July			Water 2X	12.83	acin
	August			Water 1X	8.29	acin
	September			Water 2X	9.89	acin
	October			Water 2X	4.51	acin
	November			Water 1X	1.82	acin
Pest-Gopher (Gopher Bait)	March	ATV		Gopher Bait	3.00	lbs
Pest-Gopher (Squirrel Bait)	May	ATV		Squirrel Bait	3.00	lbs
Pest-Ants (Clinch or Distance)	June	ATV		Clinch	1.00	lbs
Pest-Disease: Brown Rot (Rovral)	February	66HP 2WD	Orchard Sprayer	Rovral	1.00	pt
Pest-Disease: ShotHole (Vanguard/Ziram)	March	66HP 2WD	Orchard Sprayer	Vanguard	7.50	oz
				Ziram	8.00	lbs
Pest-Dormant (Asana, Oil)	January	66HP 2WD	Orchard Sprayer	Asana	4.00	floz
				Supreme Oil	6.00	gal
Pest-Mite (Omite) -NOW (Imidan)	June	66HP 2WD	Orchard Sprayer	Omite	7.50	lbs
				Imidan	4.30	lbs
Fertilize N (Ammonium Nitrate)	March	66HP 2WD	Spreader	33.5-0-0	120.00	lb N
	July	66HP 2WD	Spreader	33.5-0-0	120.00	lb N
Fertilize Boron (Solubor)	October	66HP 2WD	Orchard Sprayer	Solubor	2.00	lb
Remove Leaves (ZnSO4)	November	66HP 2WD	Orchard Sprayer	Zinc Sulfate	108.00	lb
Fertilize-Leaf Samples 1/20ac	June					
Weed-Mow 10X	March 1X	66HP 2WD	Mower/Chopper 8'			
	April 2X	66HP 2WD	Mower/Chopper 8'			
	May 2X	66HP 2WD	Mower/Chopper 8'			
	June 2X	66HP 2WD	Mower/Chopper 8'			
	July 2X	66HP 2WD	Mower/Chopper 8'			
	Aug 1X	66HP 2WD	Mower/Chopper 8'			
Weed-Spot Spray (Roundup)	March	ATV	Spot Sprayer	Roundup	1.00	pt
	July	ATV	Spot Sprayer	Roundup	1.00	pt
Weed-Dormant (Surflan Goal) Tree Row	December	ATV	Weed Sprayer	Surflan	2.16	pt
				Goal	1.62	pt
Pollination	February	Custom		Bee Hives	3.00	hives
Winter Sanitation- Shake, Rake, Shred	December	66HP 2WD	Mower/Chopper 8'			
		Custom		Shake/Sweep		
Pest Control Advisers	Annual	Custom				
Pickup	Annual	Pickup 1/2 T				
ATV	Annual	ATV				
<b>Harvest:</b>						
Harvest-Shake, Rake, Sweep, Haul	August	Custom				
Harvest-Hull/Shell	August	Custom				

\*Rates are per broadcast acre