UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2012

SAMPLE COSTS TO ESTABLISH A PRUNE ORCHARD AND PRODUCE

PRUNES

(DRIED PLUMS)

SACRAMENTO VALLEY

French Variety & Low-Volume Irrigation

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(Dried Plums)

Sacramento Valley - 2012

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INTRODUCTION

Sample costs to establish a prune orchard and produce prunes in the Sacramento Valley are presented in this study. The study is intended as a guide only, and can be used to make production decisions, determine potential returns, prepare budgets and evaluate production loans. The practices described are based on production procedures considered typical for this crop and area, and 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*", is provided to enter your actual costs on Tables 2 and 3.

The hypothetical farm operation, production practices, overhead, and calculations are described under assumptions. For additional information or explanation of calculations used in the study call the Department of Agricultural and Resource Economics, University of California, Davis, (530) 752-3589 or the UC Cooperative Extension office in your county.

Sample Cost of Production Studies for many commodities can be downloaded from the Department of Agricultural and Resource Economics website at http://coststudies.ucdavis.edu, requested through the department (530-752-6887) or obtained from your local UC Cooperative Extension office.

ASSUMPTIONS

The assumptions refer to Tables 1 through 8 and pertain to sample costs to establish an orchard and produce prunes under drip or other 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 105 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. Prunes are being established on 100 acres; roads, irrigation systems and farmstead occupy five acres. The land is assumed to be adequately drained class II soil.

Establishment Cultural Practices and Material Inputs (Table 1)

Land Preparation. The orchard is established on ground previously planted to another tree crop. Land preparation by a custom operator begins with deep ripping in two directions to a two to three foot depth to break up underlying compaction. The ground is disced three times and floated two to three times to level and smooth the surface. The tree rows are fumigated uncovered with Telone C-35. Berms on which the trees are planted are made by the grower. All preplant operations are done in the year prior to planting; however costs are shown in the first year.

Planting. The trees are planted in March. A planting contractor marks the tree sites, digs the holes, plants, paints and places tree wraps over the tree. Tree wraps are supplied by the nursery and the paint cost is included. In the second year, 2% or 4 trees per acre are replanted.

Trees. The prune variety 'Improved French' is planted on a 17-foot X 14-foot spacing, 183 trees per acre. Orchard life is estimated to be 30 years.

Training and Pruning. New trees are topped soon after planting. Pruning and training begins in the first dormant season – March of the second year. In the fifth year branches are tied with twine to reduce limb breakage.

Nutrition. Nitrogen (N) and potassium (K), the major nutrients required for proper tree growth and yield, are applied through the irrigation system. Nitrogen is applied beginning in the first year. It is applied two to four times from April through June. N should be applied during the middle half of the irrigation set to avoid nitrate leaching. Annual rates of actual N per acre, assuming good crop set, are shown in Table A. Starting in the fourth year, sulfate of potash applications are injected in equal amounts through the drip system, from April through June for a total of 300 pounds of material per acre per year. Crop load determines tree N and K demand, and so should be considered before applying fertilizers.

Table A. Applied N

Year	N lb/acre
1	10
2	25
3	40
4	75
5	100
6	125
7+	150

Irrigation. Water costs will vary depending on the irrigation district, power source, well characteristics, and irrigation setup. In this study, water is pumped from an onsite well assuming a cost of $45.96 per acre-foot ($3.83/acre inch). No assumption is made regarding effective rainfall. Applied water for each year is estimated in Table B.

Table B. Applied Water

Year	AcIn/Yr
1	9
2	18
3	24
4+	30

Pollination. Bees are essential for setting a marketable crop. In some years, supplementing bees may be necessary. Beginning in the fourth establishment year, one hive per two acres is placed in the orchard each year.

Pest Management. Pesticides and rates mentioned in this cost study are taken from *UC Integrated Pest Management Guidelines, Prune (www.ipm.ucdavis.edu)*. See the Integrated Pest Management (IPM) website for alternatives. Best management practices (BMP) are assumed.

Weeds. Roundup is applied to tree rows shortly after planting. In the first year, Surflan and Roundup are applied in November. Beginning in the second year, Surflan, Goal, and Roundup are applied as a dormant strip spray. Roundup is applied in May or as necessary as a spot or summer strip spray. Vegetation in the row middles is managed by mowing five times - one time per month from April through August.

Insects/Mites. Aphids, peach twig borer (PTB), and spider mites are the primary insects considered. PTB is treated in May of the first and second years with Intrepid. Aphids and mites are treated as needed (no costs shown). Beginning in the fourth year, the pest management program varies in response to pest pressure (Table D). Rotation of materials and selection of least toxic pesticides is encouraged. In this study, supreme oil plus Asana are applied as a dormant application in January to control aphids, low levels of scale, European red and brown almond mites, and PTB. Alternatively, Asana is applied in November as a predormant spray to control aphids the following year. Dipel is added to the two March bloom disease sprays for PTB control. Spider mites may occur in any year, but not necessarily every year. In this study, an in-season (June) miticide spray of Epi-Mek (abamectin) is applied every-other year to represent the occasional need to control spider mites. For operations or materials not applied every year, a portion of that cost is prorated to the orchard each year.

Diseases. Brown rot, russet scab and rust are the primary diseases considered. Russet scab is not a disease, but a physiological condition affecting the fruit skin. Application of certain fungicides at full bloom can reduce russet scab, so scab management practices and costs are included with diseases. Treatments begin in the fourth year. Bloom sprays, one with Vangard at greentip in early March and one with Bravo, Orbit and summer oil approximately 10 days later at full bloom are applied to control brown rot and reduce the incidence of russet scab. Wettable or spray sulfur is applied in May for rust control. Rain at harvest can occur occasionally but not every year, so an Orbit spray plus oil is included once every five years to control fruit brown rot and one fifth of the cost is shown each year.

Vertebrate Pests. During the first three establishment years, gophers are managed in the spring (March) with the use of poison bait placed underground using a mechanical bait applicator. It is assumed that the gopher population is under control by the end of the third year and only spot treatments are necessary. Beginning in the fourth year, squirrels are baited in May, June, September and October using anti-coagulants in bait stations on the field perimeter.

Harvest. Prunes begin economic production in the fourth year and reach full production in the seventh year. In this study, the crop is harvested and hauled by a custom harvester. Custom harvest operations are charged on a fresh or green ton basis. Dehydration reduces the weight of fresh prunes by approximately 3:1. This study assumes a 3:1 dry ratio and the grower pays the drying costs.

Table C. Annual Yields

	Tons Per Acre	
Year	Green*	Dry
4	2.4	0.80
5	4.0	1.33
6	8.0	2.67
7+	12.0	4.00

* 3 green tons = 1 dry ton

Yields and Returns. See yields and returns in Production section. Typical yields from the fourth year of orchard establishment to maturity are shown in Table C.

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

Pruning. Hand pruning every year, and mechanical topping in alternate years, are done during the winter months, (November - Early March); often, mechanical pruning is done early because machines are heavy and cannot operate on wet soils. Mechanical topping begins in the seventh year and one-half of that cost is charged to the orchard each year. Trees are topped just prior to pruning. Prunings are placed in the row middles and shredded using a flail mower.

Irrigation. The orchard is irrigated an average of twice weekly using drip irrigation from April through September. A total of 30 acre inches are applied annually. Water costs in this study are based on grower pumping costs and estimated labor. Water is pumped from an onsite well at $45.96 per acre-foot ($3.83/acre inch). Water costs will vary depending on the irrigation district, power source, well characteristics, and irrigation setup. No assumption is made regarding effective rainfall.

Nutrition. Nitrogen (N) as UN-32 is injected through the drip irrigation system in equal amounts, three times between April and June for a seasonal total of 150 pounds of N per acre. Adjustments for nitrogen contributions from groundwater should be accounted for in the season total. Potassium levels are maintained with sulfate of potash applications injected in equal amounts through the drip system, also from April through June/July for a total of 300 pounds of material per acre per year. Labor for managing the fertilizer is included in the irrigation labor.

Sampling. Leaf samples are collected in July at one sample per 25 acres. The samples are collected by a pest control adviser (PCA) and the cost shown is for the lab analysis.

Pest Management. Pesticides and rates suggested in this cost study are listed in *UC Integrated Pest Management Guidelines, Prunes.* Additional information on other pesticides, pest identification, monitoring, and management can be found at the UC IPM website http://www.ipm.ucdavis.edu. Written recommendations are required for many pesticide applications and are made by licensed PCAs. 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 volume purchased. **Pesticide costs in this study are taken from participating growers and include grower discounts. Prices shown are the average price as reported by the growers.**

Pest Control Adviser (PCA). The PCA or crop consultant monitors the orchard for production problems including pests and nutrition and writes pesticide recommendations. Growers may hire private PCAs or receive the service as part of an agreement with an agricultural chemical and fertilizer company. A private Crop Consultant is assumed in this study.

Weeds. Surflan, Goal, and Roundup are applied in November as a dormant strip spray. Roundup is applied as a summer strip or spot treatment in May. Vegetation in the row middles is managed by mowing five times, one time per month from April through August.

Insects/Mites. Aphids, peach twig borer (PTB), scale and spidermites are the primary insects considered. Mites are not insects but are included in this section. Pests should be monitored and treated accordingly. Supreme Oil and Asana are applied as a dormant application in January to control aphids, low levels of scale, European red and brown almond mites and PTB in year 1. Asana is applied as a predormant spray in November for aphid control the following year and Dipel is added to the two March bloom disease sprays for PTB control. Spider mites may occur in any year, but not necessarily every year; therefore in this study, an in-season miticide spray of Epi-Mek (abamectin) in June is applied every-other year to account for the occasional need to control spider mites. Applications not made every year are prorated so that a portion of the cost is included each year.

Table D. Alternating Disease/Insect Spray Program

	Mature Year 1		Mature Year 2	
MONTH	PEST	MATERIAL	PEST	MATERIAL
Jan	Scale, PTB, Mites[1]	Oil*+Asana*		
early Mar	Brown Rot	Vangard	Brown Rot, PTB	Vangard+Dipel*
mid Mar	Rot, Scab	Bravo+Orbit	Rot, Scab, PTB	Bravo+Orbit+Dipel*
May	Rust	Sulfur	Rust	Sulfur
Jun	Spider mites	Epi-Mek*		
Aug	Brown Rot	Orbit+Oil**		
Nov	Aphid	Asana*		

*Oil, Asana, Dipel, Epi-Mek = one time per two years **Orbit+oil = one time per five years

[1] European red mites and brown almond mites

Diseases. Bloom sprays, one with Vangard at greentip in early March and a second with Bravo, Orbit and oil approximately 10 days later at full bloom, control brown rot and reduce russet scab. Wettable or spray sulfur is applied in May every other year for rust control in wet springs. Rain at harvest will occur occasionally, so an Orbit plus oil spray is included once every five years for possible fruit brown rot infections. One fifth of the cost is included each year.

Vertebrate Pests. Gophers are assumed to be well managed in the mature orchard and March bait treatments are only made as necessary. Squirrels are managed using anti-coagulant bait stations on the field perimeter and the stations are maintained during May, June, September and October.

Fruit Thinning. In some years, trees may overcrop and mechanical thinning is necessary. In this study, it is assumed that over the life of the orchard, thinning will be needed every other year. Therefore, one half of the fruit thinning cost is charged to the orchard each year.

Pollination. Bees are considered essential for setting a marketable crop. Normally, the natural bee population is sufficient, however in some years supplemental bees may be needed. In this study, one hive per acre is used in the mature orchard.

Harvest. In this study, the crop is harvested and hauled by custom operators. Custom harvest operations are charged on a fresh or green ton basis. The custom harvester shakes, catches and dumps fruit into bins which are left in the field. The bins are picked up by self propelled bin carriers that deliver fruit to the staging area where bins are fork lifted onto flatbed trucks and driven to dehydrators. The custom operator furnishes the forklift. If fruit size is excessively small, bar sizing on the harvester is available for an additional cost. Sizing is assumed to be needed every year and the cost will vary depending on how much it slows down the harvesting operation. The grower pays the hauling and drying costs.

Yields/Drying. Dehydration reduces the weight of fresh prunes by approximately 3:1 (dry ratio). Annual yields for prunes are measured in dry tons per acre. This high density cost study assumes average production over the life of the orchard to be four dry tons per acre.

Returns. A return of $1,400 is based on grower information for 2011. The estimated return also provides a basis for a range of yields and prices shown in Table 5. Returns are based on prune size with large size prunes receiving a higher price than small prunes.

Assessments. Under a state marketing order, the California Prune Board (California Dried Plum Board) http://Californiadriedplums.org, collects mandatory assessment fees. This assessment is charged to the grower to fund prune marketing, advertising, and research programs administered by the California Prune Board. The portion of the assessment paid by the grower is $25.26 per dry ton.

Pickup/ATV. The study assumes business use of one-hour per acre per year for the pickup. The All Terrain Vehicle (ATV) is used for weed spraying, baiting squirrels and gophers and is included in those costs. Additional ATV uses for checking the orchard, monitoring diseases and the irrigation system are shown as a line item. The travel is estimated and not taken from any specific data.

Labor, Interest and Equipment

Labor. Hourly wages for workers are $10.50 for machine operators and $8.00 per hour non-machine labor. Adding 40% for the employer's share of federal and state payroll taxes, workers compensation insurance, for fruit crops and other possible benefits gives the labor rates shown of $14.70 and $11.20 per hour for machine labor and non-machine labor, respectively. Workers' compensation costs will vary among growers, but for this study the cost is based upon the average industry final rate as of January 1, 2012 (California Department of Insurance). Labor for operations involving machinery are 20% higher than the operation time given in Table 2 to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and field repair.

Equipment Operating Costs. Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by American Society of Agricultural and Biological Engineers (ASABE). Fuel and lubrication costs are also determined by ASABE equations based on maximum power takeoff (PTO) horsepower, and fuel type. Prices for on-farm delivery of diesel and gasoline are $3.43 and $3.82 per gallon, respectively. The cost includes a 2.5% local sales tax on diesel fuel and 7.5% sales tax on gasoline. Gasoline also includes federal and state excise tax, which are refundable for on-farm use when filing your income tax. The fuel, lube, and repair cost per acre for each operation in Table 2 is determined by multiplying the total hourly operating cost in Table 7 for each piece of equipment used for the selected operation by the hours per acre. Tractor time is 10% higher than implement time for a given operation to account for setup, travel and down time.

Interest on Operating Capital. Interest on operating capital is based on cash operating costs and is calculated monthly until harvest at a nominal rate of 5.75% per year. A nominal interest rate is the typical market cost of borrowed funds. The interest cost of post harvest operations is discounted back to the last harvest month using a negative interest charge. The rate will vary depending upon various factors, but the rate in this study is considered a typical lending rate by a farm lending agency as of January 2012.

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

Cash Overhead.

Cash overhead consists of various cash expenses paid out during the year that are assigned to the whole farm and not to a particular operation.

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 0.803% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs $754 for the entire farm.

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

Sanitation Services. Sanitation services provide a double portable toilet with washing equipment for the orchard and cost the farm $1,280 annually. The cost includes delivery and weekly service during the crop year.

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

Non-Cash Overhead.

Non-cash overhead, shown on an annual per acre basis 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 (e.g., tractors and implements) the remaining value is a percentage of the new cost of the investment (Boehlje and Eidman). The percent remaining value is calculated from equations developed by the American Society of Agricultural and Biological Engineers (ASABE) based on equipment type and years of life. The life in years is estimated by dividing the wearout life, as given by ASABE by the annual hours of use in this operation. For other investments including irrigation systems, buildings, and miscellaneous equipment, the value at the end of its useful life is zero. The salvage value for land is the purchase price because land does not depreciate. The purchase price and salvage value for equipment and investments are shown in Table 6.

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

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

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

Land. Crop or bare land values range from $3,500 to $10,000. The orchard site is assumed to be on previously farmed orchard ground. The basic land value in this study is $9,000 per acre or $9,450 per producing acre (100 acres).

Irrigation System. The estimated cost is based on one 75 horsepower electric pump lifting 30 acre-inches from a water level depth of 90 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 and the installation of a new filtration system, and drip hose. Water is pumped through a filtration station into a drip system. The life of the irrigation system is estimated to be 30 years.

Fuel Tanks. Two 250-gallon fuel tanks are placed on stands in cement containment meeting Federal, State, and local regulations. Fuel is delivered to the equipment by gravity feed.

Shop/Field Tools. Includes shop tools/equipment, hand tools and field tools such as pruning equipment. The cost is estimated and not based on any specific data.

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 prune trees through the first year fruit is harvested less returns from production. The *Accumulated Net Cash Cost* in the fourth year shown in Table 1 represents the establishment cost per acre. For this study, the cost is $7,635 per acre or $763,500 for the 100-acre orchard. Establishment cost is amortized beginning in the fifth year over the remaining 26 years of production.

Equipment. Farm equipment is purchased new or used, but the study shows the current purchase price for new equipment. The new purchase price is adjusted to 60% to indicate a mix of new and used equipment. Annual ownership costs for equipment and other investments are shown in Table 6. Equipment costs are composed of three parts: non-cash overhead, cash overhead, and operating costs. Both of the overhead factors have been discussed in previous sections. The operating costs consist of repairs, fuel, and lubrication and are discussed under operating costs.

Table Values. Due to rounding, the totals may be slightly different from the sum of the components.

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

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SACRAMENTO VALLEY - 2012

Table 1. SAMPLE COSTS PER ACRE TO ESTABLISH A PRUNE ORCHARD

	Cost Per Acre						
Year:	1st	2nd	3rd	4th	5th	6th	**7th
Dry Tons Per Acre:	0	0	0	0.80	1.33	2.67	4.00
Planting Costs:							
Land Prep: Rip, Disk, Float	450						
Fumigate: Tree Row Uncovered (Telone C35)	1,350						
Land Prep: Build Berms	3						
Layout Orchard: Dig, Plant, Wrap, Paint	458	10					
Trees: 183 Per Acre (2% Replant In 2nd Year)	979	21					
TOTAL PLANTING COSTS	3,240	31					
Cultural Costs:							
Prune and/or Sucker	71	176	263	347	381	381	381
Vertebrate: Gopher (Bait) alternate rows	9	9	9	3	3	3	3
Fertilize: N (UN32) through drip	6	16	19	25	47	63	95
Irrigate: (water & labor)	39	74	98	128	128	128	128
Weed: Mow Middles 5X	40	38	38	38	38	38	38
Insect: PTB (Intrepid)	66	66					
Weed: Summer strip (Roundup)	15	15	15	15	15	15	15
Weed: Dormant strip (Yr 1, Surflan, Goal. Yr 2 add Roundup)	42	78	78	78	77	78	78
Fertilizer: Leaf Analysis			1	1	1	1	1
Prune: Brush disposal			8	8	8	8	8
Insect: Dormant-Scale, PTB, mite (Oil, Asana) Alt Yrs				22	22	22	22
Insect: Aphid (Asana) Alt Yrs				13	13	13	13
Disease: Brown rot, scab (Vangard). Insect: PTB (Dipel*) @ greentip				50	50	50	50
Disease: Brown rot, scab (Bravo, Orbit, Oil). Insect: PTB (Dipel*) @ bloom				61	61	61	61
Vertebrate: Squirrel (bait)				3	3	3	3
Fertilize: K (Potassium sulfate) through drip				126	126	126	126
Insect: Mites (EpiMek) Alt Yrs				19	19	19	19
Pollinate: Hives				8	8	8	15
Disease: Rust (Sulfur)				26	26	26	26
Disease: Fruit brown rot (Orbit, Oil) 1X/5 Yr				9	9	9	9
Consultant Services/PCA				20	30	30	30
Tie Trees					106		
Prune: Top (alternate years)							18
Thin Fruit: Shake trees (alternate years)							33
Pickup Truck Use	31	31	31	31	31	31	31
ATV Use	42	42	42	42	42	42	42
TOTAL CULTURAL COSTS	361	545	603	1,072	1,245	1,155	1,245
Harvest Costs:							
Shake, Catch				60	100	200	318
Haul To Dryer				29	48	96	144
Dry Fruit				264	440	880	1,320
TOTAL HARVEST COSTS				353	588	1,176	1,782
Assessments:							
California Prune Board				20	34	67	101
TOTAL ASSESSMENT COSTS				20	34	67	101
Interest On Operating Capital @ 5.75%	185	20	19	26	32	32	37
TOTAL OPERATING COSTS/ACRE	3,787	596	622	1,471	1,899	2,430	3,165

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Table 1. continued

	Cost Per Acre						
Year:	1st	2nd	3rd	4th	5th	6th	**7th
Dry Tons Per Acre:	0	0	0	0.80	1.33	2.67	4.00
Cash Overhead Costs:							
Office Expense	120	120	120	120	120	120	120
Liability Insurance	8	8	8	8	8	8	8
Sanitation Costs	13	13	13	13	13	13	13
Property Taxes	120	116	119	120	120	120	155
Property Insurance	21	17	20	20	20	20	48
Investment Repairs	105	105	105	105	105	105	112
TOTAL CASH OVERHEAD COSTS	386	377	384	385	386	386	456
TOTAL CASH COSTS/ACRE	4,172	974	1,006	1,856	2,285	2,816	3,621
INCOME/ACRE FROM PRODUCTION	0	0	0	373	621	1,246	1,867
NET CASH COSTS/ACRE FOR THE YEAR	4,172	974	1,006	1,483	1,665	1,570	1,754
PROFIT/ACRE ABOVE CASH COSTS	0	0	0	0	0	0	0
ACCUMULATED NET CASH COSTS/ACRE	4,172	5,146	6,152	**7,635**	9,299	10,870	12,624
Non-Cash Overhead (Capital Recovery Cost):							
Buildings	63	63	63	63	63	63	63
Fuel Tanks 2-250 gal	2	2	2	2	2	2	2
Shop/Field Tools	14	14	14	14	14	14	14
Land	449	449	449	449	449	449	449
Irrigation 75 HP Pump Filter System	95	95	95	95	95	95	95
Irrigation: Drip	88	88	88	88	88	88	88
Equipment	102	27	82	94	94	94	44
TOTAL CAPITAL RECOVERY COST	813	738	793	806	805	805	755
TOTAL COST/ACRE FOR THE YEAR	4,985	1,712	1,799	2,662	3,090	3,621	4,376
INCOME/ACRE FROM PRODUCTION	0	0	0	373	621	1,246	1,867
TOTAL NET COST/ACRE FOR THE YEAR	4,985	1,712	1,799	2,289	2,470	2,375	2,509
NET PROFIT/ACRE ABOVE TOTAL COST	0	0	0	0	0	0	0
TOTAL ACCUMULATED NET COST/ACRE	4,985	6,697	8,496	10,784	13,254	15,629	18,138

*Dipel applied alternate years. **See production year for complete list of operations and costs

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Table 2. COSTS PER ACRE TO PRODUCE PRUNES

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:								
Prune: Prune & Sucker	34.00	381	0	0	0	0	381	
Prune: Top. Alt Yrs	0.00	0	0	0	0	18	18	
Prune: Shred Brush	0.21	4	3	1	0	0	8	
Insect: Dormant. Scale, mites, PTB (Oil Asana) Alt Yrs	0.29	5	4	2	10	0	22	
Disease: Greentip Brown rot, scab, PTB (Vangard, Dipel*)	0.57	10	8	4	27	0	50	
Disease: Bloom. Brown rot, scab, PTB (Bravo, Orbit, Dipel*)	0.57	10	8	4	38	0	61	
Pollinate: Hives	0.00	0	0	0	15	0	15	
Vertebrate: Gophers (bait)	0.08	1	0	0	2	0	3	
Fertilize: Nitrogen (UN32)	0.00	0	0	0	95	0	95	
Fertilize: Potassium (potassium sulfate)	0.00	0	0	0	126	0	126	
Irrigate: (water & labor)	1.20	13	0	0	115	0	128	
Weed: Mow centers - 5X	1.04	18	14	6	0	0	38	
Thin Fruit: Shake Trees. Alt Yrs	0.00	0	0	0	0	33	33	
Vertebrate: Squirrel (bait)	0.00	0	0	0	3	0	3	
Weed: Summer strip spray (Roundup)	0.40	7	4	2	2	0	15	
Disease: Rust (Sulfur)	0.57	10	8	4	4	0	26	
Insect: Mite (EpiMek) Alt Yrs	0.29	5	4	2	8	0	19	
Leaf Samples 1/25 acre	0.00	0	0	0	0	1	1	
Disease: Fruit rot (Orbit, Oil) 1X/5Yr	0.11	2	2	1	4	0	9	
Weed: Dormant strip (Surflan, Goal, Roundup)	0.40	7	4	2	65	0	78	
Insect: Aphid (Asana) Alt Yrs	0.29	5	4	2	2	0	13	
Pickup Truck Use	1.00	18	10	4	0	0	31	
ATV Use	2.00	35	5	2	0	0	42	
Consultant/PCA Service	0.00	0	0	0	0	30	30	
TOTAL Cultural COSTS	43.01	532	78	37	515	81	1,243	
Harvest:								
Harvest & Size	0.00	0	0	0	0	318	318	
Haul To Dryer	0.00	0	0	0	0	144	144	
Dry Fruit	0.00	0	0	0	0	1,320	1,320	
California Prune Board	0.00	0	0	0	101	0	101	
TOTAL Harvest COSTS	0.00	0	0	0	101	1,782	1,883	
Interest on Operating Capital @ 5.75%							37	
TOTAL OPERATING COSTS/ACRE	43.00	532	78	37	616	1,863	3,163	
CASH OVERHEAD:								
Liability Insurance							8	
Office Expense							120	
Sanitation Fee							13	
Property Taxes							155	
Property Insurance							48	
Investment Repairs							105	
TOTAL CASH OVERHEAD COSTS/ACRE							448	
TOTAL CASH COSTS/ACRE							3,611	

NON-CASH OVERHEAD:	Per producing Acre	Annual Cost Capital Recovery	
Buildings 2400sqft	800	63	63
Establishment	7,635	518	518
Fuel Tanks 2-250g	35	2	2
Irrigation 75hp Pump Filter	1,500	95	95
Land	9,450	449	449
Drip Irrigation	1,400	88	88
Shop/Field Tools	150	14	14
Equipment	419	44	44
TOTAL NON-CASH OVERHEAD COSTS	21,389	1,273	1,273
TOTAL COSTS/ACRE			4,884

*Dipel applied alternate years

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Table 3. COSTS AND RETURNS PER ACRE TO PRODUCE PRUNES

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Prunes (Dried Plums)	4.00	ton	1,400.00	5,600	
TOTAL GROSS RETURNS	4.00	ton		5,600	
OPERATING COSTS					
Herbicide:				**67**	
Roundup Ultra Max	1.74	pt	2.18	4	
Surflan 4 AS	3.00	pt	9.19	28	
Goal 2 XL	3.00	pt	11.89	36	
Insecticide:				**41**	
Supreme Oil	2.80	gal	4.55	13	
Asana XL	4.42	floz	0.69	3	
Dipel DF	2.00	lb	8.78	18	
Epi-Mek 0.15EC	5.00	floz	1.50	8	
Fungicide:				**52**	
Vangard WG	5.00	floz	3.68	18	
Bravo Weather Stik	4.00	pt	6.36	25	
Orbit	4.80	floz	0.96	5	
Spray Sulfur	5.00	lb	0.72	4	
Rodenticide:				**5**	
Gopher Bait	0.25	lb	6.55	2	
Squirrel Bait	0.60	lb	4.80	3	
Fertilizer:				**221**	
UN-32	150.00	lb N	0.63	95	
Sulfate of Potash Fine (0-0-50)	300.00	lb	0.42	126	
Pollination:				**15**	
Hive	1.00	hive	15.00	15	
Water:				**115**	
Water-Pumped	30.01	acin	3.83	115	
Custom:				**1,863**	
Top Trees	0.50	acre	35.00	18	
Thin Fruit	0.50	acre	65.00	33	
Leaf Analysis	0.04	each	35.00	1	
Harvest-Shake/Catch	12.00	ton	25.00	300	
Size Fruit	6.00	ton	3.00	18	
Haul Fruit	12.00	ton	12.00	144	
Dry Fruit	12.00	ton	110.00	1,320	
Consultant/PCA Fees	1.00	acre	30.00	30	
Assessment:				**101**	
California Prune Board	4.00	ton	25.26	101	
Labor:				**532**	
Equipment Operator Labor	9.37	hrs	14.70	138	
Non-Machine Labor	35.20	hrs	11.20	394	
Machinery:				**114**	
Fuel-Gas	4.00	gal	4.00	15	
Fuel-Diesel	18.30	gal	3.43	63	
Lube				12	
Machinery Repair				25	
Interest on Operating Capital (5.75%)				37	
TOTAL OPERATING COSTS/ACRE				3,163	
NET RETURNS ABOVE OPERATING COSTS				2,437	
CASH OVERHEAD COSTS					
Liability Insurance				8	
Office Expense				120	
Sanitation Fee				13	
Property Taxes				155	
Property Insurance				48	
Investment Repairs				105	
TOTAL CASH OVERHEAD COSTS/ACRE				448	
TOTAL CASH COSTS/ACRE				3,611	

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Table 3. continued

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Buildings 2400sqft				63	
Orchard Establishment				518	
Fuel Tanks 2-250g				2	
Irrigation 75hp Pump, Well				95	
Land				449	
Drip Irrigation				88	
Shop/Field Tools				14	
Equipment				44	
TOTAL NON-CASH OVERHEAD COSTS				1,273	
TOTAL COST/ACRE				4,884	
TOTAL COST/ Ton				1,221	
NET RETURNS ABOVE TOTAL COST				716	

UC COOPERATIVE EXTENSION
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Table 4. MONTHLY CASH COSTS PER ACRE TO PRODUCE PRUNES

Beginning 01-12	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Ending 12-12	12	12	12	12	12	12	12	12	12	12	12	12	
Cultural:													
Prune: Prune & Sucker	381												381
Prune: Top. Alt Yrs	18												18
Prune: Shred Brush	8												8
Insect: Dormant. Scale, mites, PTB (Oil Asana) Alt Yrs	22												22
Disease: Greentip Brown rot, scab, PTB (Vangard, Dipel*)			50										50
Disease: Bloom. Brown rot, scab, PTB (Bravo, Orbit, Dipel*)			61										61
Pollinate: Hives			15										15
Vertebrate: Gophers (bait)			3										3
Fertilize: Nitrogen (UN32)				32	32	32							95
Fertilize: Potassium (potassium sulfate)				42	42	42							126
Irrigate: (water & labor)				12	19	26	29	25	18				128
Weed: Mow centers - 5X				8	8	8	8	8					38
Thin Fruit: Shake Trees. Alt Yrs					33								33
Vertebrate: Squirrel (bait)					1	1			1	1			3
Weed: Summer strip spray (Roundup)					15								15
Disease: Rust (Sulfur)					26								26
Insect: Mite (EpiMek) Alt Yrs						19							19
Leaf Samples 1/25 acre							1						1
Disease: Fruit rot (Orbit, Oil) 1X/5Yr								9					9
Weed: Dormant strip (Surflan Goal Roundup)											78		78
Insect: Aphid (Asana) Alt Yrs											13		13
Pickup Truck Use	3	3	3	3	3	3	3	3	3	3	3	3	31
ATV Use	3	3	3	3	3	3	3	3	3	3	3	3	42
Consultant/PCA Service	3	3	3	3	3	3	3	3	3	3	3		30
TOTAL Cultural COSTS	437	9	137	102	184	135	47	50	27	10	100	6	1,243
Harvest:													
Harvest & Size								318					318
Haul To Dryer								144					144
Dry Fruit								1,320					1,320
California Prune Board Assessment								101					101
TOTAL Harvest COSTS								1,883					1,883
Interest on Operating Capital (5.75%)	2	2	3	3	4	5	5	14	-1	-1	-1	0	37
TOTAL OPERATING COSTS/ACRE	439	11	140	106	188	140	52	1,947	27	9	99	6	3,163

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Table 4. Continued

Beginning 01-12 Ending 12-12	JAN 12	FEB 12	MAR 12	APR 12	MAY 12	JUN 12	JUL 12	AUG 12	SEP 12	OCT 12	NOV 12	DEC 12	TOTAL
CASH OVERHEAD													
Liability Insurance			8										8
Office Expense	10	10	10	10	10	10	10	10	10	10	10	10	120
Sanitation Fee	1	1	1	1	1	1	1	1	1	1	1		13
Property Taxes				77								77	155
Property Insurance			48										48
Investment Repairs	9	9	9	9	9	9	9	9	9	9	9	9	105
TOTAL CASH OVERHEAD COSTS	20	20	76	97	20	20	20	20	20	20	20	97	448
TOTAL CASH COSTS/ACRE	458	31	216	203	208	160	71	1,967	46	29	119	103	3,611

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Table 5. RANGING ANALYSIS

COST PER ACRE AT VARYING YIELDS TO PRODUCE PRUNES

	YIELD (Tons/acre)						
	2.80	3.20	3.60	4.00	4.40	4.80	5.20
OPERATING COSTS:							
Cultural	1,243	1,243	1,243	1,243	1,243	1,243	1,243
Harvest	1,318	1,506	1,695	1,883	2,071	2,260	2,448
Interest on operating capital @ 5.75%	34	35	36	37	38	39	40
TOTAL OPERATING COSTS/ACRE	2,595	2,784	2,974	3,163	3,352	3,541	3,730
Total Operating Costs/Ton	927	870	826	791	762	738	717
CASH OVERHEAD COSTS/ACRE	448	448	448	448	448	448	448
TOTAL CASH COSTS/ACRE	3,043	3,232	3,422	3,611	3,800	3,989	4,178
Total Cash Costs/Ton	1,087	1,010	950	903	864	831	804
NON-CASH OVERHEAD COSTS/ACRE	1,273	1,273	1,273	1,273	1,273	1,273	1,273
TOTAL COSTS/ACRE	4,316	4,505	4,694	4,884	5,073	5,262	5,451
Total Costs/Ton	1,541	1,408	1,304	1,221	1,153	1,096	1,048

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE($/Ton)	YIELD (Tons/acre)						
	2.80	3.20	3.60	4.00	4.40	4.80	5.20
1,100	485	736	986	1,237	1,488	1,739	1,990
1,200	765	1,056	1,346	1,637	1,928	2,219	2,510
1,300	1,045	1,376	1,706	2,037	2,368	2,699	3,030
1,400	1,325	1,696	2,066	2,437	2,808	3,179	3,550
1,500	1,605	2,016	2,426	2,837	3,248	3,659	4,070
1,600	1,885	2,336	2,786	3,237	3,688	4,139	4,590
1,700	2,165	2,656	3,146	3,637	4,128	4,619	5,110

NET RETURNS PER ACRE ABOVE CASH COSTS

PRICE($/Ton)	YIELD (Tons/acre)						
	2.80	3.20	3.60	4.00	4.40	4.80	5.20
1,100	37	288	538	789	1,040	1,291	1,542
1,200	317	608	898	1,189	1,480	1,771	2,062
1,300	597	928	1,258	1,589	1,920	2,251	2,582
1,400	877	1,248	1,618	1,989	2,360	2,731	3,102
1,500	1,157	1,568	1,978	2,389	2,800	3,211	3,622
1,600	1,437	1,888	2,338	2,789	3,240	3,691	4,142
1,700	1,717	2,208	2,698	3,189	3,680	4,171	4,662

NET RETURNS PER ACRE ABOVE TOTAL COSTS

PRICE($/Ton)	YIELD (Tons/acre)						
	2.80	3.20	3.60	4.00	4.40	4.80	5.20
1,100	-1,236	-985	-734	-484	-233	18	269
1,200	-956	-665	-374	-84	207	498	789
1,300	-676	-345	-14	316	647	978	1,309
1,400	-396	-25	346	716	1,087	1,458	1,829
1,500	-116	295	706	1,116	1,527	1,938	2,349
1,600	164	615	1,066	1,516	1,967	2,418	2,869
1,700	444	935	1,426	1,916	2,407	2,898	3,389

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Sacramento Valley - 2012

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

ANNUAL EQUIPMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead Insur-ance	Cash Overhead Taxes	Total
12 65HP 2WD Tractor	46,230	12	11,558	4,406	232	289	4,927
12 75HP 4WD Tractor	43,500	15	8,469	3,720	209	260	4,189
12 ATV 4WD	5,790	7	2,196	720	32	40	792
12 Mower - Flail 10'	5,000	10	884	569	24	29	622
12 Orch.Sprayer 500 G	21,000	10	3,714	2,388	99	124	2,611
12 Pickup Truck 1/2 T	28,000	7	10,621	3,481	155	193	3,829
12 Weed Sprayer 100 G	4,000	10	707	455	19	24	497
TOTAL	153,520		38,150	15,738	770	958	17,466
60% of new cost*	92,112		22,890	9,443	462	575	10,480

*Used to reflect a mix of new and used equipment

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead Insur-ance	Cash Overhead Taxes	Cash Overhead Repairs	Total
INVESTMENT								
Buildings 2400 sq ft	80,000	20	0	6,284	321	400	1,600	8,605
Orchard Establishment	763,500	26	0	51,751	3,065	3,818	0	58,634
Fuel Tanks 2-250 g	3,500	35	1,295	192	19	24	70	305
Irrigation 75hp Pump, Well (refurbished)	150,000	30	0	9,481	602	750	3,000	13,834
Land	945,000	30	945,000	44,888	0	9,450	0	54,338
Drip Irrigation	140,000	30	0	8,849	562	700	2,800	12,911
Shop/Field Tools	15,000	15	0	1,421	60	75	3,000	4,556
TOTAL INVESTMENT	2,097,000		946,295	122,866	4,630	15,216	10,470	153,183

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	100	acre	7.54	754
Office Expense	100	acre	120.00	12,000
Sanitation Service	100	acre	12.80	1,280

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Table 7. HOURLY EQUIPMENT COSTS

Yr Description	Prunes Hours Used	Total Hours Used	COSTS PER HOUR Capital Recovery	Cash Overhead Insur-ance	Cash Overhead Taxes	Operating Lube & Repairs	Operating Fuel	Operating Total Oper.	Total Costs/Hr.
12 65HP 2WD Tractor	87	1000	2.64	0.14	0.17	3.51	9.26	12.77	15.73
12 75HP 4WD Tractor	433	800	2.79	0.16	0.19	3.84	12.63	16.47	19.61
12 ATV 4WD	208	284	1.52	0.07	0.08	0.81	2.55	3.36	5.03
12 Mower - Flail 10'	125	125	2.73	0.11	0.14	0.71	0.00	0.71	3.70
12 Orch.Sprayer 500 G	269	269	5.33	0.22	0.28	2.69	0.00	2.69	8.52
12 Pickup Truck 1/2 T	100	285	7.33	0.33	0.41	3.50	9.55	13.05	21.11
12 Weed Sprayer 100 G	79	150	1.82	0.08	0.09	1.08	0.00	1.08	3.07

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Table 8. OPERATIONS WITH EQUIPMENT

Operation	Operation Month	Tractor	Implement	Labor Type/ Material	Rate/ acre	Unit
Prune: Pruning & Sucker	Jan			Non-Machine Labor	34.00	hours
Prune: Top Alternate Yrs	Jan			Top Trees	0.50	acre
Chop Brush	Jan	75HP 4WD	Mower - Flail 10'	Equipment Operator Labor	0.25	hour
Insect: Dormant (Oil Asana)Alt Yr	Jan	75HP 4WD	Orch.Sprayer 500 G	Supreme Oil	2.00	gal
				Asana XL	2.00	floz
Disease: Greentip. Brown Rot Scab PTB	Mar	75HP 4WD	Orch.Sprayer 500 G	Equipment Operator Labor	0.69	hour
				Vangard WG	5.00	floz
				Dipel DF	1.00	lb
Disease: Bloom. Brown Rot Scab PTB	Mar	75HP 4WD	Orch.Sprayer 500 G	Equipment Operator Labor	0.69	hour
				Bravo Weather Stik	4.00	pt
				Orbit	4.00	floz
				Dipel DF	1.00	lb
Pollinate: Hives	Mar			Pollination Fee	1.00	hive
Vertebrate: Gophers (bait)	Mar		ATV 4WD	Equipment Operator Labor	0.10	hour
				Gopher Bait	0.25	lb
Fertilize - Nitrogen	Apr			UN-32	50.00	lb N
	May			UN-32	50.00	lb N
	June			UN-32	50.00	lb N
Fertilize - Potassium	Apr			SOPotashFine0-0-50	100.00	lb
	May			SOPotashFine0-0-50	100.00	lb
	June			SOPotashFine0-0-50	100.00	lb
Irrigate	Apr			Non-Machine Labor	0.12	hour
				Water-Pumped	2.86	acin
	May			Non-Machine Labor	0.24	hour
				Water-Pumped	4.38	acin
	June			Non-Machine Labor	0.24	hour
				Water-Pumped	5.98	acin
	July			Non-Machine Labor	0.24	hour
				Water-Pumped	6.79	acin
	Aug			Non-Machine Labor	0.24	hour
				Water-Pumped	5.71	acin
	Sept			Non-Machine Labor	0.12	hour
				Water-Pumped	4.29	acin
Mow Centers - 5X	Apr	75HP 4WD	Mower - Flail 10'	Equipment Operator Labor	0.25	hour
	May	75HP 4WD	Mower - Flail 10'	Equipment Operator Labor	0.25	hour
	June	75HP 4WD	Mower - Flail 10'	Equipment Operator Labor	0.25	hour
	July	75HP 4WD	Mower - Flail 10'	Equipment Operator Labor	0.25	hour
	Aug	75HP 4WD	Mower - Flail 10'	Equipment Operator Labor	0.25	hour
Thin Fruit: Shake Trees Alt Yrs	May			Thin Fruit	0.50	acre
Vertebrate: Squirrel (bait)	May		ATV 4WD	Squirrel Bait	0.15	lb
	June		ATV 4WD	Squirrel Bait	0.15	lb
	Sept		ATV 4WD	Squirrel Bait	0.15	lb
	Oct		ATV 4WD	Squirrel Bait	0.15	lb
Weed: Summer Strip (Roundup)	May	65HP 2WD	Weed Sprayer 100 G	Equipment Operator Labor	0.48	hour
				Roundup Ultra Max	1.02	pt
Disease: Rust (Sulfur)	May	75HP 4WD	Orch.Sprayer 500 G	Equipment Operator Labor	0.69	hour
				WE Spray Sulfur	5.00	lb
Insect: Mite (EpiMek) alt yr	June	75HP 4WD	Orch.Sprayer 500 G	Equipment Operator Labor	0.34	hour
				Epi-Mek 0.15EC	5.00	floz
Leaf Samples 1/25 acre	July			Leaf Analysis	0.04	each
Insect: PM (Orbit Oil) 1X/5Yr	Aug	75HP 4WD	Orch.Sprayer 500 G	Equipment Operator Labor	0.14	hour
				Orbit	0.80	floz
				Supreme Oil	0.80	gal
Weed-Dormant Strip (SurfGoalRu)	Nov	65HP 2WD	Weed Sprayer 100 G	Equipment Operator Labor	0.48	hour
				Surflan 4 AS	3.00	pt
				Goal 2 XL	3.00	pt
				Roundup Ultra Max	0.72	pt
Insect: Aphid (Asana) alt yrs	Nov	75HP 4WD	Orch.Sprayer 500 G	Equipment Operator Labor	0.34	hour
				Asana XL	2.42	floz

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Table 8. continued

Operation	Operation Month	Tractor	Implement	Labor Type/ Material	Rate/ acre	Unit
Pickup Truck Use	Nov		Pickup Truck 1/2 T	Non-Machine Labor		
ATV Use	Nov		ATV 4WD	Equipment Operator Labor	2.40	hours
PCA Service	Nov			PCA Fees	1.00	acre
Harvest & Size	Aug			Harvest-Shake/Catch	12.00	ton
				Size Fruit	6.00	ton
Haul To Dryer	Aug			Haul Fruit	12.00	ton
Dry Fruit	Aug			Dry Fruit(fresh Ton)	12.00	ton
California Prune Board	Aug			California Prune Board	4.00	ton