
UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2007

SAMPLE COSTS TO ESTABLISH
A PRUNE ORCHARD AND PRODUCE

PRUNES

(DRIED PLUMS)



SACRAMENTO VALLEY

French Variety & Low-Volume Irrigation

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SAMPLE COSTS TO ESTABLISH A PRUNE ORCHARD and PRODUCE PRUNES (Dried Plums) Sacramento Valley - 2007

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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.

Current and many archived Sample Cost of Production Studies for many commodities are available and can be downloaded from the Department of Agricultural and Resource Economics website at <http://coststudies.ucdavis.edu> or obtained from your local UC Cooperative Extension office. These studies as well as archived studies not on the website can be requested through the department by calling (530) 752-1517.

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ASSUMPTIONS

The assumptions refer to Tables 1 through 8 and pertain to sample costs to establish an orchard and produce prunes under micro sprinkler or low volume irrigation in the Sacramento Valley. The cultural practices described represent production operations and materials considered typical for a well managed farm in the region. Costs, materials, and practices in this study will not apply to all farms. Timing of and types of cultural practices will vary among growers within the region and from season to season due to variables such as weather, soil, insect and disease pressure. The study is intended as a guide only. **The use of trade names and cultural practices in this report does not constitute an endorsement or recommendation by the University of California nor is any criticism implied by omission of other similar products or cultural practices.**

Farm. The hypothetical farm consists of 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. The owner farms the land.

Establishment Cultural Practices and Material Inputs (Table 1)

Land Preparation. 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. 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. Fumigation, not included in this study, should be considered if nematodes represent a potential problem.

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 3 trees per acre are replanted.

Trees. The prune variety Improved French, is planted on an 18-foot X 18-foot diamond spacing, 15.6 feet between rows at 155 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 leaching of nitrate or urea. Annual rates of actual N per acre, assuming good crop set, are shown in Table A. Starting in the fourth year, sulfate of potash at 300 pounds of material is applied in equal amounts through the irrigation system also from April through June.

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) based on grower costs. No assumption is made regarding effective rainfall. Applied water for each year is shown in Table B.

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

Pollination. Bees are essential for setting a marketable crop. In most years, the natural bee pollination is sufficient for good pollination. In some years, additional bees may be necessary. Beginning in the fourth establishment year, one-fourth hive is charged to the orchard each year.

Pest Management. The pesticides and rates mentioned in this cost study are listed in *UC Integrated Pest Management Guidelines, Prune*. See the Integrated Pest Management (IPM) website for alternatives. Best management practices (BMP) are assumed. BMPs are shown in Table 2 and the input details are in Table 3.

Weeds. Roundup is applied to the tree rows shortly after planting. In November of the first year, Surflan and Roundup are applied during the dormant season (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 to the tree row 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. Aphids, peach twig borer (PTB), San Jose scale (SJS) and spider mites are the primary insects considered. Peach twig borer (PTB) is treated in May of the first and second years with Intrepid. Beginning in the fourth year, the insecticide program rotates over a two year period (see Table D). In the first rotation, Supreme Oil and Asana are applied as a dormant application in January to control aphids, low to moderate levels of scale, European red and Brown almond mites and PTB. The oil also can advance bloom. Asana is applied in November as a predormant spray to control aphids the following year. In the second rotation, Dipel is added to the two March bloom disease sprays for peach twig borer control. Spider mites may occur in any year, but not necessarily every year; therefore in this study, an in-season miticide spray of Vendex in June 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 the cost depending on how often applied is prorated to the orchard each year.

Diseases. Brown rot, prune russet scab and prune rust are the primary diseases considered. Prune russet scab is not a disease, but a physiological condition affecting the fruit skin. However, application of certain fungicides at full bloom can reduce the incidence of this cosmetic condition, so scab management practices and costs are considered with diseases. Treatments begin in the fourth year. Bloom sprays, one with Vangard at greentip in early March and one with Bravo and Orbit approximately 10 days later at full bloom are applied to control brown rot and reduce the incidence of prune scab. Wettable or spray sulfur is applied in May to control prune rust. Wet conditions at harvest occur occasionally, so an Orbit spray is included once every five years to control 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. Squirrels are baited in April, May, June, September and October using anti-coagulants beginning in the fourth year.

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 fresh (undried) tons. Drying reduces the weight of fresh prunes by approximately 3:1 dry ratio. The grower pays the drying costs.

Year	Tons Per Acre	
	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); most mechanical pruning might be done early because of wet soils in normal winters. Topping begins in the seventh year and one-half of the cost is charged to the orchard each year. The trees are topped just prior to pruning. Prunings are placed in the row middles and shredded using a flail mower.

Irrigation. The field is irrigated an average of twice weekly through a micro-sprinkler system from April through September. A total of 30 acre inches is applied. The water costs in this study are based on grower pumping costs and the labor is estimated. The water is pumped from an onsite well and cost \$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 irrigation system in equal amounts, three times between April and June for a seasonal total of 150 pounds of N per acre. Potassium levels are maintained with sulfate of potash applications injected in equal amounts through the micro sprinkler system, also from April through June 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. An ATV is used to move around the field and it is assumed that it takes two hours (0.02 hours/acre) to collect and package the samples.

Pest Management. The pesticides and rates mentioned in this cost study are listed in *UC Integrated Pest Management Guidelines, Prunes*. For more information on other pesticides available, pest identification, monitoring, and management visit the UC IPM website at www.ipm.ucdavis.edu. Written recommendations are required for many pesticides and are made by licensed pest control advisors. For information and pesticide use permits, contact the local county agricultural commissioner's office. Adjuvants or surfactants may be recommended for use with some pesticides, but are not included in this study. Pesticide costs vary by location and volume purchased. Pesticide costs in this study are taken from a single dealer and shown as full retail.

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

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

Insects. Aphids, peach twig borer (PTB), San Jose scale (SJS) and spider mites are the primary insects considered. The insecticide program rotates over a two year period. In the first rotation, Supreme Oil and Asana are applied as a dormant application in January to control aphids, low to moderate levels of scale, European red and brown almond mites and PTB. The oil also can advance

Table D. Two Year Disease/Insect Spray Program

MONTH	Rotation 1		Rotation 2	
	PEST	MATERIAL	PEST	MATERIAL
Jan	Scale, PTB, Mites ¹	Oil*+Asana*		
early Mar	Brown Rot	Vanguard	Brown Rot, PTB	Vanguard+Dipel*
mid Mar	Rot, Scab	Bravo+Orbit	Rot, Scab, PTB	Bravo+Orbit+Dipel*
May	Rust	Sulfur	Rust	Sulfur
Jun	Spider mites	Vendex*		
Aug	Brown Rot	Orbit**		
Nov	Aphid	Asana*		

*Oil, Asana, Dipel, Vendex = one time per two years

**Orbit = one time per five years

¹ European red mites and Brown almond mites

bloom. Asana is applied as a predormant spray in November for aphid control the following year. In the second rotation, Dipel is added to the two March bloom disease sprays for peach twig borer control. Spider mites may occur in any year, but not necessarily every year; therefore in this study, an in-season miticide spray of Vendex in June is applied every-other year to represent 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.

Diseases. Bloom sprays, one with Vanguard at green tip in early March and one with Bravo and Orbit approximately 10 days later at full bloom, control brown rot and reduce the incidence of prune scab. Wettable or spray sulfur is applied in May to control prune rust. Wet conditions at harvest occur occasionally, so an Orbit spray is included once every five years for possible brown rot infections. One fifth of the cost is included each year.

Vertebrate Pests. Gophers are assumed to be under control and in March bait treatments are made as necessary in the orchard. Squirrels are managed using anti-coagulant bait stations on the field perimeter and the stations are maintained during April, May, June, September and October. The grower uses an ATV to move around the field.

Fruit Thinning. In some years crop load may be excessive and mechanical thinning may be 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 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. Typically one to 1.5 hives are used. It is assumed in this study that supplemental bees will be needed every other year; therefore one-half the cost of one hive is charged to the orchard each year.

Harvest. In this study, the crop is harvested and hauled by custom operators. Custom harvest operations are charged on fresh (undried) tons. The custom harvester shakes the trees, catches the fruit, 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 the bins are forklifted 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 not needed every year and the cost will vary depending on how much it slows down the harvesting operation. In this study, it assumed that sizing is needed in alternate years, therefore, one-half the cost is charged to the operation each year. The grower pays the drying costs and hauling costs.

Yields/Drying. Drying reduces the weight of fresh prunes by approximately 3:1 dry ratio. Annual yields for prunes are measured in dry tons per acre. Over the years, a well managed mature prune orchard can average four dry tons per year.

Returns. A return of \$1,200 is based on the average price received from 2002 to 2005 (California Data Annual Prices Received) plus an expected price for 2006 based on an average gross return between \$1,400 and \$1,500 (News Release, Prune Bargaining Association). 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. For 2006, the negotiated price based on the final size of the crop as determined by the USDA-National Agricultural Statistics Service ranged from \$1,600 to \$650.

Assessments. Under a state marketing order, the California Dried Plum Board (CDPB) collects mandatory assessment fees. This assessment is charged to the grower to fund prune marketing, advertising, and research programs administered by the CDPB. The portion of the assessment paid by the grower is \$22 per dry ton.

Pickup/ATV. The study assumes business use mileage of 3,000 miles 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, diseases and 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 43% 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 \$15.02 and \$11.44 per hour for machine labor and non-machine labor, respectively. Workers' compensation costs will vary among growers, but for this study the cost is based upon the average industry final rate as of January 1, 2005 (California Department of Insurance). Labor for operations involving machinery are 20% higher than the operation time given in Table 2 to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and field repair.

Equipment Operating Costs. Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by American Society of Agricultural Engineers (ASAE). Fuel and lubrication costs are also determined by ASAE equations based on maximum power takeoff (PTO) horsepower, and fuel type. Prices for on-farm delivery of diesel and gasoline are \$2.30 and \$2.80 per gallon, respectively. The cost includes a 2% local sales tax on diesel fuel and 8% sales tax on gasoline. Gasoline also includes federal and state excise tax, which are refundable for on-farm use when filing your income tax. The fuel, lube, and repair cost per acre for each operation in Table 2 is determined by multiplying the total hourly operating cost in Table 7 for each piece of equipment used for the selected operation by the hours per acre. Tractor time is 10% higher than implement time for a given operation to account for setup, travel and down time.

Interest on Operating Capital. Interest on operating capital is based on cash operating costs and is calculated monthly until harvest at a nominal rate of 10.00% 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 2007.

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 0.714% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$674 for the entire farm.

Office Expense. Office and business expenses are estimated at \$100 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 \$1,125 annually. The cost includes delivery and five months of weekly service.

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 $((\text{Purchase Price} - \text{Salvage Value}) \times \text{Capital Recovery Factor}) + (\text{Salvage Value} \times \text{Interest Rate})$.

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery (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 Engineers (ASAE) based on equipment type and years of life. The life in years is estimated by dividing the wearout life, as given by ASAE by the annual hours of use in this operation. For other investments including irrigation systems, buildings, and miscellaneous equipment, the

value at the end of its useful life is zero. The salvage value for land is the purchase price because land does not depreciate. The purchase price and salvage value for equipment and investments are shown in Table 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 7.25% is used to calculate capital recovery. The rate will vary depending upon loan amount and other lending agency conditions, but is the basic suggested rate by a farm lending agency as of January 2007.

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 \$3,000 to \$6,500. The orchard site is assumed to be on previously farmed orchard ground. The basic land value in this study is \$5,500 per acre or \$5,775 per producing acre (100 acres).

Irrigation System. The 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 micro sprinklers. Water is pumped through a filtration station into a micro-sprinkler system, one sprinkler per tree. The life of the irrigation system is estimated to be 30 years for the pump and filtration system, and 15 years for the micro-sprinklers.

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 \$5,522 per acre or \$552,200 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.

UC COOPERATIVE EXTENSION
Table 1. COSTS PER ACRE TO ESTABLISH A PRUNE ORCHARD
 SACRAMENTO VALLEY - 2007

	Cost Per Acre							
	Year:	1st	2nd	3rd	4th	5th	6th	**7th
Dry Tons Per Acre:					0.80	1.33	2.67	4.00
Planting Costs:								
Land Prep: Rip, Disk, Float		350						
Land Prep: Build Berms		3						
Layout Orchard: Dig, Plant, Wrap, Paint		310	6					
Trees: 155 Per Acre (2%Replant In 2nd Year)		775	15					
TOTAL PLANTING COSTS		1,438	21					
Cultural Costs:								
Prune and/or Sucker		59	149	223	297	320	320	320
Vertebrate: Gopher (Bait) alternate rows		9	9	9	3	3	3	3
Fertilize: N (UN32) through sprinklers		5	12	14	18	35	46	69
Irrigate: (water & labor)		39	74	98	129	129	129	129
Weed: Mow Middles 5X		34	34	34	34	34	34	34
Insect: PTB (Intrepid)		60	60					
Weed: Summer Strip (Roundup)		20	20	20	20	20	20	20
Weed: Dormant Strip (Yr 1, Surflan, Goal. Yr 2 add Roundup)		62	111	111	111	111	111	111
Leaf Collection & Analysis				2	2	2	2	2
Prune: Brush Disposal (shred)				7	7	7	7	7
Insect: Dormant-Scale, PTB, Mite (Oil, Asana) 1X/2 Yrs					21	21	21	21
Insect: Aphid (Asana) 1X/2 Yrs					12	12	12	12
Disease: Brown rot, (Vanguard). Insect: PTB (Dipel*) @ greentip					57	57	57	57
Disease: Brown rot (Bravo Orbit), Scab (Bravo). Insect: PTB (Dipel*) @ bloom					86	86	86	86
Vertebrate: Squirrel (bait)					4	4	4	4
Fertilize: K (potassium) through sprinklers					75	75	75	75
Insect: Mites (Vendex) 1X/2 Yrs					36	36	36	36
Pollinate: Hives					6	6	6	12
Disease: Rust (Sulfur)					21	21	21	21
Disease: Brown rot (Orbit) 1X/5 Yrs					8	8	8	8
Consultant Services					25	25	25	25
Tie Trees						92		
Prune: Top 1X/2 Yrs								15
Thin Fruit: Shake Trees 1X/2 Yrs								33
Pickup Truck Use		28	28	28	28	28	28	28
ATV Use		41	41	41	41	41	41	41
TOTAL CULTURAL COSTS		358	538	587	1,043	1,173	1,093	1,170
Harvest Costs:								
Shake, Catch (custom)					66	110	220	348
Haul To Dryer (custom)					29	48	96	144
Dry Fruit (custom)					300	500	1,000	1,500
TOTAL HARVEST COSTS					395	658	1,316	1,992
Assessments:								
California Dried Plum Board					18	29	59	88
TOTAL ASSESSMENT COSTS					18	29	59	88
Interest On Operating Capital @ 10.00%		160	35	30	41	50	51	60
TOTAL OPERATING COSTS/ACRE		1,956	594	618	1,496	1,910	2,518	3,309

UC COOPERATIVE EXTENSION

Table 1. CONTINUED

SACRAMENTO VALLEY - 2007

	Cost Per Acre							
	Year:	1st	2nd	3rd	4th	5th	6th	**7th
Dry Tons Per Acre:					0.80	1.33	2.67	4.00
Cash Overhead Costs:								
Office Expense	100	100	100	100	100	100	100	100
Liability Insurance	7	7	7	7	7	7	7	7
Sanitation Costs	11	11	11	11	11	11	11	11
Property Taxes	78	78	78	78	78	78	78	106
Property Insurance	15	15	14	15	15	15	15	35
Investment Repairs	84	84	84	84	84	84	84	90
TOTAL CASH OVERHEAD COSTS	295	295	294	295	295	295	295	348
TOTAL CASH COSTS/ACRE	2,251	889	911	1,791	2,205	2,813	2,813	3,658
INCOME/ACRE FROM PRODUCTION				320	532	1,068	1,068	1,600
NET CASH COSTS/ACRE FOR THE YEAR	2,251	889	911	1,471	1,673	1,745	1,745	2,058
PROFIT/ACRE ABOVE CASH COSTS	0	0	0	0	0	0	0	0
ACCUMULATED NET CASH COSTS/ACRE	2,251	3,140	4,051	5,522	7,195	8,940	8,940	10,998
Non-Cash Overhead (Capital Recovery Cost):								
Buildings	77	77	77	77	77	77	77	77
Fuel Tanks 2-250 gal	3	3	3	3	3	3	3	3
Shop/Field Tools	17	17	17	17	17	17	17	17
Land	419	419	419	419	419	419	419	419
Irrigation: Pump, Filter System	14	14	14	14	14	14	14	14
Irrigation: Sprinkler	190	190	190	190	190	190	190	190
Equipment	120	119	103	117	117	117	117	117
TOTAL CAPITAL RECOVERY COST	839	838	822	836	836	836	836	836
TOTAL COST/ACRE FOR THE YEAR	3,090	1,727	1,734	2,627	3,041	3,650	3,650	4,494
INCOME/ACRE FROM PRODUCTION				320	532	1,068	1,068	1,600
TOTAL NET COST/ACRE FOR THE YEAR	3,090	1,727	1,734	2,307	2,509	2,582	2,582	2,894
NET PROFIT/ACRE ABOVE TOTAL COST	0	0	0	0	0	0	0	0
TOTAL ACCUMULATED NET COST/ACRE	3,090	4,817	6,551	8,858	11,367	13,948	13,948	16,842

X = times as 1X/2 Yrs = alternate years or 1 time every two years

* Dipel applied 1X/2 Yrs or alternate years

**See production year for complete list of operations and costs

UC COOPERATIVE EXTENSION
Table 2. COSTS PER ACRE TO PRODUCE PRUNES
 Sacramento Valley - 2007

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per acre				Total Cost	Your Cost
		Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent		
Cultural:							
Prune: Hand	28.00	320	0	0	0	320	
Prune: Top Trees (alternate years)	0.00	0	0	0	15	15	
Prune: Shred Brush	0.21	4	3	0	0	7	
Insect: Dormant-Scale, Mites, PTB (Oil, Asana) (alternate years)	0.29	5	5	11	0	21	
Disease: Brown Rot (Vanguard). Insect: PTB (Dipel*) @ greentip	0.57	10	9	38	0	57	
Disease: Brown Rot, Scab (Bravo, Orbit). Insect: PTB (Dipel*) @ bloom	0.57	10	9	67	0	86	
Pollinate: Hives (alternate years)	0.00	0	0	12	0	12	
Vertebrate: Gophers (bait)	0.08	1	0	2	0	3	
Vertebrate: Squirrels (bait)	0.00	0	0	4	0	4	
Fertilize: N (UN32) through sprinklers	0.00	0	0	69	0	69	
Fertilize: K (potassium sulfate) through sprinklers	0.00	0	0	75	0	75	
Irrigate: water & labor	1.20	14	0	115	0	129	
Weed: Mow Centers 5X	1.04	19	16	0	0	34	
Thin Fruit: Shake Trees (alternate years)	0.00	0	0	0	33	33	
Weed: Summer Strip (Roundup)	0.40	7	4	9	0	20	
Disease: Rust (Sulfur)	0.57	10	9	1	0	21	
Insect: Mites (Vendex) alternate years	0.29	5	5	26	0	36	
Nutrition: Leaf Sampling	0.01	0	0	0	1	2	
Disease: Brown rot (Orbit) once every 5 years	0.11	2	2	4	0	8	
Weed: Dormant Strip (Goal, Surflan, Roundup)	0.40	7	4	99	0	111	
Insect: Aphid (Asana) alternate years	0.29	5	5	3	0	12	
Pickup	1.00	18	10	0	0	28	
ATV	2.00	36	5	0	0	41	
PCA Service	0.00	0	0	0	25	25	
TOTAL CULTURAL COSTS	37.03	475	87	534	74	1,170	
Harvest:							
Shake, Catch, Size. (size in alternate years)	0.00	0	0	0	348	348	
Haul to Dryer	0.00	0	0	0	144	144	
Dry	0.00	0	0	0	1,500	1,500	
CDPB Assessment	0.00	0	0	88	0	88	
TOTAL HARVEST COSTS	0.00	0	0	88	1,992	2,080	
Interest on operating capital @ 10.00%						60	
TOTAL OPERATING COSTS/ACRE		475	87	622	2,066	3,309	
CASH OVERHEAD:							
Office						100	
Liability Insurance						7	
Sanitation Service						11	
Property Taxes						106	
Property Insurance						34	
Investment Repairs						90	
TOTAL CASH OVERHEAD COSTS						348	
TOTAL CASH COSTS/ACRE						3,658	

UC COOPERATIVE EXTENSION

Table 2. CONTINUED

Sacramento Valley - 2007

Operation	Operation	Cash and Labor Costs per acre				Total Cost	Your Cost
	Time (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/Rent		
Non-Cash Overhead (Capital Recovery):	Per producing Acre			Annual Cost			
				Capital Recovery			
Buildings	800			77		77	
Fuel Tanks 2-250ga	35			3		3	
Shop/Field Tools	150			17		17	
Land	5,775			419		419	
Irrigation System: Pumps, etc	175			14		14	
Irrigation: Sprinkler System	1,700			190		190	
Establishment	5,522			478		478	
Equipment	963			117		117	
TOTAL NON-CASH OVERHEAD COSTS		15,120		1,314		1,314	
TOTAL COSTS/ACRE							4,971

*Asana, Dipel applied alternate years, 1/2 cost included each year

UC COOPERATIVE EXTENSION
Table 3. COSTS AND RETURNS PER ACRE TO PRODUCE PRUNES
 Sacramento Valley - 2007

	Quantity /Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Walnuts	4.00	ton	1,200.00	4,800	
OPERATING COSTS					
Rodenticide:					
Gopher Getter Ag-Wilco	0.25	lb	6.50	2	
Ground Squirrel Bait - Wilco	0.75	lb	5.40	4	
Irrigation:					
Water	30.00	acin	3.83	115	
Fungicide:					
Vanguard WG	5.00	floz	4.52	23	
Bravo Weather Stik	4.00	pt	8.21	33	
Orbit (once per five years)	4.80	floz	4.88	23	
Spray Sulfur (wetable sulfur)	5.00	lb	0.22	1	
Insecticide/Miticides:					
Supreme Oil (alternate years)	2.00	gal	4.55	9	
Asana XL (alternate years)	4.42	floz	1.08	5	
Vendex 50WP (alternate years)	0.75	lb	34.59	26	
Dipel DF (alternate years)	2.00	lb	14.38	29	
Fertilizer:					
UN-32	150.00	lb N	0.46	69	
Sulfate of Potash Fines Water Soluble (0-0-50)	300.00	lb	0.25	75	
Pollination:					
Hives (alternate years)	0.50	hive	24.00	12	
Herbicide:					
Roundup Ultra Max	1.74	pt	8.58	15	
Goal 2XL	3.00	pt	16.45	49	
Surflan 4AS	3.00	pt	14.52	44	
Custom:					
Harvest Shake & Catch	12.00	ton	27.50	330	
Size Fruit (alternate years)	6.00	ton	3.00	18	
Haul Fruit	12.00	ton	12.00	144	
Dry Fruit	12.00	ton	125.00	1,500	
PCA Service	1.00	acre	25.00	25	
Leaf Analysis	0.04	each	30.00	1	
Top Trees (alternate years)	0.50	acre	30.00	15	
Thin Fruit (shake)	0.50	acre	65.00	33	
Assessment:					
California Dried Plum Board	4.00	ton	22.00	88	
Labor (machine)	9.39	hrs	15.02	141	
Labor (non-machine)	29.21	hrs	11.44	334	
Fuel - Gas	3.90	gal	2.80	11	
Fuel - Diesel	18.32	gal	2.30	42	
Lube				8	
Machinery repair				26	
Interest on operating capital @ 10.00%				60	
TOTAL OPERATING COSTS/ACRE				3,309	
NET RETURNS ABOVE OPERATING COSTS				1,491	

UC COOPERATIVE EXTENSION

Table 3. CONTINUED

Sacramento Valley - 2007

	Quantity /Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
CASH OVERHEAD COSTS:					
Office				100	
Liability Insurance				7	
Sanitation Service				11	
Property Taxes				106	
Property Insurance				34	
Investment Repairs				90	
TOTAL CASH OVERHEAD COSTS/ACRE				348	
TOTAL CASH COSTS/ACRE				3,657	
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Buildings				77	
Fuel Tanks 2-250ga				3	
Shop/Field Tools				17	
Land				419	
Irrigation System: Pumps, etc				14	
Irrigation: Sprinkler System				190	
Establishment				478	
Equipment				117	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				1,314	
TOTAL COSTS/ACRE				4,971	
NET RETURNS ABOVE TOTAL COSTS				-171	

UC COOPERATIVE EXTENSION
Table 4. MONTHLY CASH COSTS PER ACRE TO PRODUCE PRUNES
 Sacramento Valley - 2007

Beginning JAN 07	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Ending DEC 07	07	07	07	07	07	07	07	07	07	07	07	07	
Cultural:													
Prune: Hand	320												320
Prune: Top Trees (alternate years)	15												15
Prune: Shred Brush	7												7
Insect: Dormant-Scale, Mites, PTB (Oil, Asana)	21												21
Disease: Brown rot, (Vanguard). Insect: PTB (Dipel) @ greentip			57										57
Disease: Brown rot, Scab (Bravo, Orbit). Insect: PTB (Dipel) @ bloom			86										86
Pollinate: Hives (alternate years)			12										12
Vertebrate: Gophers (bait)			3										3
Vertebrate: Squirrels (bait)				1	1	1			1	1			4
Fertilize: N (UN32) through sprinklers				23	23	23							69
Fertilize: K (potassium sulfate) through sprinklers				25	25	25							75
Irrigate: water & labor				12	20	26	29	25	18				129
Weed: Mow Centers 5X				7	7	7	7	7					34
Thin Fruit: Shake Trees (alternate years)					33								33
Weed: Summer Strip (Roundup)					20								20
Disease: Rust (Sulfur)					21								21
Insect: Mites (Vendex) alternate years						36							36
Nutrition: Leaf Sampling							2						2
Disease: Brown rot (Orbit) once every 5 years								8					8
Weed: Dormant Strip (Goal, Surflan, Roundup)											111		111
Insect: Aphid (Asana) alternate years											12		12
Pickup	2	2	2	2	2	2	2	2	2	2	2	2	28
ATV	3	3	3	3	3	3	3	3	3	3	3	3	41
PCA Service	2	2	2	2	2	2	2	2	2	2	2		25
TOTAL CULTURAL COSTS	371	8	167	76	157	125	45	47	27	9	131	6	1,170
Harvest:													
Shake, Catch, Size. (size in alternate years)								348					348
Haul to Dryer								144					144
Dry								1,500					1,500
CDPB Assessment								88					88
TOTAL HARVEST COSTS								2,080					2,080
Interest on operating capital @ 10.00%	3	3	5	5	6	8	8	26	-1	-1	-1	0	60
TOTAL OPERATING COSTS/ACRE	374	11	172	81	163	133	53	2,153	25	8	130	6	3,309

UC COOPERATIVE EXTENSION

Table 4. CONTINUED

Sacramento Valley - 2007

Beginning JAN 07	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Ending DEC 07	07	07	07	07	07	07	07	07	07	07	07	07	
CASH OVERHEAD:													
Office	8	8	8	8	8	8	8	8	8	8	8	8	100
Liability Insurance				7									7
Sanitation Service	1	1	1	1	1	1	1	1	1	1	1		11
Property Taxes	53						53						106
Property Insurance	17						17						34
Investment Repairs	7	7	7	7	7	7	7	7	7	7	7	7	90
TOTAL CASH OVERHEAD COSTS	87	17	17	24	17	17	87	17	17	17	17	16	348
TOTAL CASH COSTS/ACRE	461	28	188	105	180	150	140	2,170	42	25	147	21	3,657

UC COOPERATIVE EXTENSION

Table 5. RANGING ANALYSIS

Sacramento Valley - 2007

COSTS 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 Cost	1,170	1,170	1,170	1,170	1,170	1,170	1,170
Harvest Cost (Shake, Catch, Move Bins)	244	278	313	348	383	418	452
Haul to Dryer	101	115	130	144	158	173	187
Dry	1,050	1,200	1,350	1,500	1,650	1,800	1,950
Assessment	62	70	79	88	97	106	114
Interest on operating capital	55	56	58	60	61	63	65
TOTAL OPERATING COSTS	2,682	2,889	3,100	3,310	3,519	3,730	3,938
Total Operating Costs/ton	958	903	861	827	800	777	757
CASH OVERHEAD COSTS	348	348	348	348	348	348	348
TOTAL CASH COSTS	3,030	3,237	3,448	3,658	3,867	4,078	4,286
Total Cash Costs/ton	1,082	1,011	958	914	879	850	824
NON-CASH OVERHEAD COSTS	1,314	1,314	1,314	1,314	1,314	1,314	1,314
TOTAL COSTS	4,344	4,551	4,762	4,972	5,181	5,392	5,600
Total Costs/ton	1,551	1,422	1,323	1,243	1,177	1,123	1,077

NET RETURNS PER ACRE ABOVE OPERATING COSTS

\$/ton	YIELD (tons/acre)						
	2.80	3.20	3.60	4.00	4.40	4.80	5.20
800	-442	-329	-220	-110	1	110	222
900	-162	-9	140	290	441	590	742
1,000	118	311	500	690	881	1,070	1,262
1,100	398	631	860	1,090	1,321	1,550	1,782
1,200	678	951	1,220	1,490	1,761	2,030	2,302
1,300	958	1,271	1,580	1,890	2,201	2,510	2,822
1,400	1,238	1,591	1,940	2,290	2,641	2,990	3,342

NET RETURNS PER ACRE ABOVE CASH COSTS

\$/ton	YIELD (tons/acre)						
	2.80	3.20	3.60	4.00	4.40	4.80	5.20
800	-790	-677	-568	-458	-347	-238	-126
900	-510	-357	-208	-58	93	242	394
1,000	-230	-37	152	342	533	722	914
1,100	50	283	512	742	973	1,202	1,434
1,200	330	603	872	1,142	1,413	1,682	1,954
1,300	610	923	1,232	1,542	1,853	2,162	2,474
1,400	890	1,243	1,592	1,942	2,293	2,642	2,994

NET RETURNS PER ACRE ABOVE TOTAL COSTS

\$/ton	YIELD (tons/acre)						
	2.80	3.20	3.60	4.00	4.40	4.80	5.20
800	-2,104	-1,991	-1,882	-1,772	-1,661	-1,552	-1,440
900	-1,824	-1,671	-1,522	-1,372	-1,221	-1,072	-920
1,000	-1,544	-1,351	-1,162	-972	-781	-592	-400
1,100	-1,264	-1,031	-802	-572	-341	-112	120
1,200	-984	-711	-442	-172	99	368	640
1,300	-704	-391	-82	228	539	848	1,160
1,400	-424	-71	278	628	979	1,328	1,680

UC COOPERATIVE EXTENSION
Table 6. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT AND BUSINESS OVERHEAD
 Sacramento Valley - 2007

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
						Insur- ance	Taxes		
07	65HP 2WD Tractor	46,230	12	11,558	5,262	206	289		5,757
07	75HP MFWD Tractor	43,500	15	8,469	4,521	186	260		4,967
07	All Terrain Vehicle (ATV)	7,430	7	2,818	1,068	37	51		1,155
07	Mower-Flail 10 ft	10,272	10	1,817	1,349	43	60		1,453
07	Orchard .Sprayer 500 Gal	21,000	10	3,714	2,759	88	124		2,971
07	Pickup 1/2 ton	28,000	7	10,621	4,023	138	193		4,354
07	Weed Sprayer 100 Gal	4,000	10	707	526	17	24		566
TOTAL		160,432		39,704	19,507	714	1,001		21,222
60% of New Cost *		96,259		23,822	11,704	429	600		12,733

*Used to reflect a mix of new and used equipment

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insur- ance	Taxes	Repairs	
INVESTMENT								
Buildings 2400 sqft	80,000	20		7,699	286	400	1,600	9,984
Establishment	552,200	26		47,777	1,971	2,761	552	53,061
Fuel Tanks 2 - 250 gal	3,500	35	1,295	269	17	24	70	380
Irrigation: Pump, etc.	17,500	30		1,446	62	88	350	1,946
Land	577,500	30	577,500	41,869	0	5,775	0	47,644
Irrigation: Sprinklers	170,000	15		18,961	607	850	3,400	23,818
Shop/Field Tools	15,000	15		1,673	54	75	3,000	4,802
TOTAL INVESTMENT	1,415,700		578,795	119,693	2,997	9,972	8,972	141,635

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	100	acre	6.74	674
Office Expense	100	acre	100.00	10,000
Sanitation Service	100	acre	11.25	1,125

UC COOPERATIVE EXTENSION
Table 7. HOURLY EQUIPMENT COSTS
 Sacramento Valley - 2007

Yr	Description	COSTS PER HOUR							Total Costs/Hr.
		Actual Hours Used	Cash Overhead			Operating			
			Capital Recovery	Insur- ance	Taxes	Repairs	Fuel & Lube	Total Oper.	
07	65HP 2WD Tractor	87	36.15	1.42	1.98	2.01	7.14	9.15	48.70
07	75HP MFWD Tractor	434	6.26	0.26	0.36	1.82	9.74	11.56	18.44
07	All Terrain Vehicle (ATV)	209	3.06	0.11	0.15	0.54	2.15	2.69	6.01
07	Mower-Flail 10 ft	125	6.49	0.21	0.29	2.21	0.00	2.21	9.20
07	Orchard .Sprayer 500 Gal	269	6.15	0.20	0.28	3.52	0.00	3.52	10.15
07	Pickup 1/2 ton	100	24.14	0.83	1.16	2.04	8.05	10.09	36.22
07	Weed Sprayer 100 Gal	79	3.97	0.13	0.18	1.06	0.00	1.06	5.34

UC COOPERATIVE EXTENSION
Table 8. OPERATIONS WITH EQUIPMENT
 SACRAMENTO VALLEY - 2007

Operation	Operation Month	Equipment Tractor	Implement	Non-Mach	Material	Broadcast Rate/acre	Unit
				Labor hrs/acre			
Cultural:							
Prune:	Mar			28.00			
Prune: Top (alternate years)	Mar	Custom					
Prune: Shred Brush	Mar	75 HP	Flail Mower				
Insect: Dormant (alternate years)	Jan	75 HP	Orchard Sprayer		*Oil	2.00	gal
					*Asana	2.00	floz
Disease: Rot. Insect: PTB @ greentip	Mar	75 HP	Orchard Sprayer		Vanguard	5.00	floz
					*Dipel	1	lb
Disease: @ Bloom. Rot, Scab. Insect: PTB	Mar	75 HP	Orchard Sprayer		Bravo	4.00	pt
					Orbit	4.00	floz
					*Dipel	1.00	lb
Pollinate: Hives (alternate years)	Mar	Custom			Bee Hive	0.50	acre
Vertebrate: Gopher	Mar	ATV			Bait	0.25	lb
Vertebrate: Squirrel	Apr	ATV			Bait	0.15	lb
	May	ATV			Bait	0.15	lb
	June	ATV			Bait	0.15	lb
	Sept	ATV			Bait	0.15	lb
	Oct	ATV			Bait	0.15	lb
Fertilize: N (through irrigation)	Apr				UN32	50.00	lbs N
	May				UN32	50.00	lbs N
	June				UN32	50.00	lbs N
Fertilize: K (through irrigation)	Apr				SOP	100.00	lb
	May				SOP	100.00	lb
	June				SOP	100.00	lb
Irrigate:	Apr			0.12	Water	2.86	acin
	May			0.24	Water	4.38	acin
	June			0.24	Water	5.98	acin
	July			0.24	Water	6.79	acin
	Aug			0.24	Water	5.71	acin
	Sept			0.12	Water	4.29	acin
Weed: Mow Centers	Apr	75 HP	Flail Mower				
	May	75 HP	Flail Mower				
	June	75 HP	Flail Mower				
	July	75 HP	Flail Mower				
	Aug	75 HP	Flail Mower				
Thin Fruit: Shake (alternate years)	May	Custom					
Weed: Summer Strip	May	65 HP	Weed Sprayer		Roundup	1.02	pt
Disease: Rust	July	75 HP	Orchard Sprayer		Sulfur	5.00	lb
Insect: Mites, Misc (alternate years)	June	75 HP	Orchard Sprayer		*Vendex	0.75	lb
Nutrition: Leaf Samples	July	ATV		0.02	Analysis	0.04	each
Insect: Brown rot (once per 5 years)	Aug	75 HP	Orchard Sprayer		**Orbit	0.80	floz
Harvest: Shake, Collect, Size, Bin Carrier	Aug	Custom					
Harvest: Haul to Dryer	Aug	Custom					
Harvest: Dry Fruit	Aug	Custom					
Weed: Dormant	Nov	65 HP	Weed Sprayer		Surflan	3.00	pt
					Goal	3.00	pt
					Roundup	0.72	pt
Insect: Aphid (alternate years)	Nov	75 HP	Orchard Sprayer		*Asana	4.85	floz

*alternate years, 1/2 rate allocated each year. **1/5 rate allocated each year.