
UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2004

**SAMPLE COSTS TO PRODUCE
STRAWBERRIES**



SAN JOAQUIN VALLEY

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INTRODUCTION

The sample costs to produce strawberries in the San Joaquin 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 farm. 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 1 and 2.

The hypothetical farm operation, production practices, overhead, and calculations are described under assumptions. For additional information or explanation of calculations 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 at <http://coststudies.ucdavis.edu>, requested through the Department of Agricultural and Resource Economics, UC Davis, (530) 752-4424 or obtained from the local county UC Cooperative Extension office. Some archived studies are also available on the website.

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ASSUMPTIONS

The following assumptions refer to Tables 1 to 7 and pertain to sample costs to produce strawberries in the San Joaquin Valley. The cultural practices described and materials used are considered typical for a well-managed strawberry field in the region. The costs, materials and practices will not apply to all situations every production year. Cultural practices and costs for the production of strawberries vary by grower and region, and 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.**

Farm. This report is based on a 25 contiguous acre farm. The rented land is planted to 10-acres of strawberries and the remaining acres to Asian vegetables. The grower and family do the majority of the labor for the operations (except for harvest), but a labor cost (opportunity cost) is shown for each operation.

Production Operating Costs

Land Preparation. Fields are generally fumigated every two to three years in July with methyl bromide. Custom operators plow the land one time, disc two times, fumigate, and list and shape the beds in mid July.

Plant Establishment. Several varieties are available for planting in the region, but Chandler and Camarosa predominate. Bed width in the region ranges from 52 to 56 inches. In this study the strawberries are planted in August on 52-inch beds, two rows per bed at 12-inch plant spacing for a total of 20,105 plants per acre. Five percent of the plants (1,005) are replanted and included in the planting costs. The grower punches planting holes in the beds with a mechanical punch wheel. Frozen 'frigo' plants from a commercial nursery are delivered to the edge of the blocks where planting labor soaks the plants in a bucket of water and then places the strawberry plants in the punched holes.

Fertilization. UN32 fertilizer is applied through the drip system once each month in September, October, and November, then twice each month in February, March, April, and May at 27.5 pounds (2.5 gallons) per application. In January, 15-15-15 fertilizer at 100 pounds per acre is applied to the bed surface, prior to covering with the plastic mulch.

Irrigation. The irrigation costs include the pumping cost and irrigation labor. Irrigation labor is calculated at 0.15 hours per acre per irrigation. Immediately after planting, the plants are irrigated through the drip line. The plants are irrigated every four to five days during September and October, twice a month during November and December, once a week during February and March, every three days during April, May, and June until final harvest. Effective rainfall is not taken into account; therefore a total of 36 acre-inches (including the preplant irrigations) are applied to the field. The drip tape is buried in the bed at one line per bed soon after the beds are made. Trenches are made at the field edge with the grower's tractor and furrowing shovel. The laterals are laid in the trench and then covered using the grower's tractor with blade. The drip tape is trimmed and connected to the lateral lines and the lines are tested for leaks at which time a preirrigation is applied.

Water. Water costs were provided from the growers per acre pumping charges for the summer months and converted to an acre-inch cost of \$4.83.

Mulch. Runners formed by the plant are cut by hand in October/November to encourage formation of larger plants. The procedure can be combined with hand weeding. To apply the mulch, the plants are mowed to about 3-inches with the grower's tractor and mower in January, and the mowings are raked by hand into the furrows. The plastic mulch is laid over the plants and beds. The grower does three rows per pass with a tractor driver and six men – two per row to lay mulch and shovel dirt to secure the mulch. Three people burn holes in the plastic and pull the plants through the holes.

Pests. The pesticides and rates mentioned in this cost study are listed in the *UC IPM Pest Management Guidelines, Strawberries*. For more information on other pesticides available, pest identification, monitoring, and management visit the UC IPM website at www.ipm.ucdavis.edu. Pesticide applications, timing, and materials vary according to pest pressure. Written recommendations are required for many commercially applied pesticides and are made by licensed pest control advisers. For information and pesticide use permits, contact the local county Agricultural Commissioner's office. Adjuvants are recommended for many pesticides for effective control, but are not included. Pesticide costs may vary by location and grower volume. Pesticide costs in this study are taken from a single dealer and shown as full retail.

Fumigation. Arthropods, soilborne fungi/diseases, nematodes, and weeds are controlled with the preplant fumigation. Fumigation is done every two to three years. In this study one-half the cost is included each year. Costs may also be incurred for field measuring, field maps and fumigation layout, obtaining permission from nearby residents, and meeting with county representatives. Flat fumigation by a custom operator is the most likely method in this area. The custom operator furnishes the fumigant material (methyl bromide plus chloropicrin), plastic tarp, glue, and three men including the tractor driver. A custom company removes the tarps and hauls to the dump and again one-half the cost is included each year.

Fumigation Alternatives. The phaseout of methyl bromide has prompted growers to try alternative methods. According to industry information, a common alternative used by a few growers is applying soil fungicide and nematicide materials such as Inline and metam sodium through the drip line. Research data has provided information on the alternative methods, although the long-term effects on disease and weed management are unknown. Research data is available on the California Strawberry Commission website at <http://www.calstrawberry.com>. Grower costs for the drip method using Inline fungicide/nematicide and a chloropicrin material with application will cost the growers \$800 to \$1,000 per acre. The effects on yield, weed, and pest control are variable and these variables may add to the production costs and/or reduce yield.

Weeds. In addition to preplant fumigation, weeds are controlled by hand weeding in September, October, November, February and March. Although weeding times vary by grower and month, the study assumes an average of five hours per acre per month.

Diseases. Botrytis fruit rot (*Botrytis cinerea*) is the only disease treated in this study. The grower applies Topsin and Rovral fungicides in March.

Insects. Acramite miticide, Dipel, and Malathion insecticides are applied in May to control two-spotted mite (*Tetranychus urticae*), beet armyworm (*Spodoptera exigua*), lygus (*Lygus hesperus*) and cutworm (*Agrotis ipsilon*). The grower applies the materials with his tractor and sprayer.

Pickup. The pickup is used for business and pleasure. The grower travels 30 miles per acre for strawberry business. The data is assumed and not taken from any specific information.

Harvest. The crop is harvested from mid-April through mid-June and delivered to a processing plant. Fresh market strawberries are sold on site or at a farmers market. The crop can be severely limited by hot weather.

Processed Market. The grower hires a 30-man crew and crew foreman to supervise the picking for the freezer. The field is picked an average of twice a week. The picker carries trays into the field that hold 15 to 18 pounds of strawberries. The ripe strawberries are picked by hand and placed in the containers/tray. Picking rate per picker ranges from four to five freezer trays per hour. Additional field labor includes one field checker to check for proper picking, and one picking card puncher per crew to count the trays picked by each picker. To load and haul the fruit, one truck loader stacks the trays on the truck and the truck driver delivers the strawberries to the cooler. The grower uses a flatbed truck that holds 180 freezer trays per load for delivery to the freezer. The truck driver travels approximately 20 miles roundtrip per load to deliver the filled trays to the freezer.

Fresh Market. Although, the family does the daily fresh market picking in this study, labor hours for picking and associated costs are shown. It is assumed, the pickers will pick six to seven fresh market trays (12 pound) per hour. Fresh market strawberries not picked by the family will incur overhead costs— crew foreman, field checker, card puncher – similar to those incurred when picking for the freezer or processed market. The fruit stand is located next to the field; therefore no delivery charges are shown for fresh market produce.

Yields. The crop yield in this study is 30,000 pounds per acre, 21,000 (10.50 tons) for the freezer/processing and 9,000 pounds (750 12-lb trays) for the fresh market/roadside sales. Processing yields are the 2001-2003 average yield for the Fresno - Manteca area (2003 Processing Strawberry Board). Fresh market yields for this study are assumed to be 30% of gross production. Although in reality, fresh market sales appear to remain fairly steady, regardless of total yield. Therefore the fresh market percentage of gross production will fluctuate.

Returns. Based on grower information, the grower received \$0.28 per pound for the processing market. Fresh market returns as reported by the participating growers are \$10 per 12-pound tray. The grower sells the fresh picked strawberries at the on-site fruit stand. The stand is assumed to be open 7-days per week, 8-hours per day during the harvest time (approximately 2 months) with one family person in attendance. The operating costs are divided over the 10 acres. The attendant may spend some time picking, but that cost is not separated from the fresh picking costs above. The prices used in this study provide a basis for a range of yields and returns as shown in Table 4.

Assessments. The grower pays \$.045 per tray to the Strawberry Commission for research and marketing. Fresh market assessment is per tray (12 lbs in this study) and the freezer assessment is on 14-pound tray equivalents.

Year-end Cleanup. The plants are mowed. The plastic mulch and drip tape are pulled and rolled by hand and hauled to the dump. The field is then disked one time in preparation for the next crop and the disking operation is incorporated with the land preparation in this study.

Labor. Labor rates of \$12.15 per hour for machine operators and \$9.11 for general labor includes payroll overhead of 35%. The basic hourly wages are \$9.00 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 truck crops (code 0172), 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 5, 2004 (California Department of Insurance). Labor for operations involving machinery are 20%

higher than the operation time given in Table 1 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 Agriculture 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 \$1.45 and \$1.88 per gallon, respectively. The fuel prices are averaged, based on four California delivery locations plus \$0.24 per gallon, which is one-half the difference between the high and low price for regular gasoline in 2003 from the California State Automobile Association Monthly Survey. 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 Table 1 are determined by multiplying the hours per acre for the selected operation by the total hourly operating cost in Table 6 for each piece of equipment used in that operation. 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 6.89% 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. 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 that affect the profitability and economic viability of strawberry production. The risks associated with producing and marketing strawberries should not be minimized.

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. Employee benefits, insurance, and payroll taxes are included in labor costs and not in overhead (see Labor).

Property Taxes. Counties charge a base property tax rate of 1% on the assessed value of the property. In studies where the farm is rented, no costs for land taxes are shown. 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 \$419 for the entire farm.

Office Expense. Office and business expenses are approximated at \$50 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, office and shop utilities, and miscellaneous expenses.

Land Rent. The 25 acres are rented for cash at \$300 per acre. The rented land includes the irrigation system that is maintained by the landlord.

Sanitation Services. Sanitation services provide portable toilets with washing equipment and cost the farm \$654 annually for the strawberries. The cost includes delivery and three months of weekly cleaning 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 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 and purchase price for land are the same because land does not depreciate. The purchase price and salvage value for equipment and investments are shown in Table 5.

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 6.23% used to calculate capital recovery cost is the United States Department of Agriculture-Economic Reporting Service's (USDA-ERS) ten year average of California's agricultural sector long-run real 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.

Land. Land values in the region range from \$2,000 to \$5,500 for row cropland. Being the land is rented, ownership costs are not shown.

Irrigation System. Water is pumped through a filtration station into main lines. Reusable lateral lines owned by the grower are buried each year at the edge of the strawberry field and are connected to the main and drip lines. One drip line is buried in each bed prior to planting. The lateral lines have a 5-year life and the drip lines are an annual expense. The pumping system already existed on the site and the irrigation system costs are charged to the landowner.

Equipment. Farm equipment is purchased new or used, but the study shows the current purchase price for new equipment. Strawberry production requires much specialized equipment including modifications to commercial tractors. Many of these modifications are made in machine shops and are not necessarily included in the equipment costs shown in the tables. Some of the other specialized equipment is also built in machine or farmer shops and retail prices are not readily available. The new purchase price is adjusted to 40% to indicate a mix of new and used equipment. Annual ownership costs for equipment and other investments are shown in the Whole Farm Annual Equipment, Investment, and Business Overhead Costs table. 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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UC COOPERATIVE EXTENSION
Table 1. COSTS PER ACRE to PRODUCE STRAWBERRIES
 SAN JOAQUIN VALLEY 2004

Operation	Operation Time (Hrs/A)	Cash and Labor Cost per acre					Total Cost	Your Cost
		Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent			
Cultural:								
Land Prep: Plow, Disc	0.00	0	0	0	100	100		
Fumigate: Flat, Tarped, 1X/2 Yr	0.00	0	0	0	900	900		
Fumigate: Plastic Retrieval/Landfill 1X/2 Yr	0.00	0	0	0	33	33		
Land Prep: List/Shape 52"beds	0.00	0	0	0	100	100		
Irrigate: Install Drip Tape 1/bed	2.00	50	10	151	0	211		
Irrigate: Trench for laterals/Connect drip	0.20	37	1	0	0	38		
Plant: Punch Holes in Soil	1.00	15	5	0	0	20		
Irrigate: (water & labor)	2.55	25	0	174	0	199		
Plant: (includes replant)	45.00	437	0	1,478	0	1,915		
Fertilize: through drip (UN32)	0.00	0	0	48	0	48		
Weed: Hand	25.00	243	0	0	0	243		
Mulch: Cut Runners (hand)	48.00	467	0	0	0	467		
Fertilize: Beds (15-15-15)	0.26	4	1	20	0	25		
Mulch: Mow Plants	0.41	6	2	0	0	9		
Mulch: Rake Mowings into Furrow (hand)	9.00	87	0	0	0	87		
Mulch: Lay Plastic Mulch	1.50	110	9	210	0	329		
Mulch: Burn Holes in Mulch	15.00	146	0	0	0	146		
Disease: Botrytis/Mildew (Rovral, Topsin)	0.58	9	3	76	0	88		
Insect: Mite (Acramite) Worms (Dipel) Lygus (Malathion)	0.58	9	3	89	0	101		
Year End: Crop Removal	2.00	119	35	12	0	167		
Pickup: Business Use	2.00	31	14	0	0	44		
TOTAL CULTURAL COSTS	155.08	1,796	82	2,258	1,133	5,268		
Harvest:								
Harvest- Fresh (family labor)	116.00	1,128	0	312	0	1,440		
Harvest- Freezer	298.00	2,897	0	0	0	2,897		
Load/Haul- Freezer	2.36	188	29	0	0	217		
Assessments	0.00	0	0	101	0	101		
Sell Fresh @ Fruitstand (family labor)	48.00	467	0	0	0	467		
TOTAL HARVEST COSTS	464.36	4,679	29	414	0	5,121		
Interest on operating capital @ 6.89%						344		
TOTAL OPERATING COSTS/ACRE		6,474	111	2,671	1,133	10,732		
CASH OVERHEAD:								
Liability Insurance						17		
Office Expense						50		
Sanitation Fee						65		
Land Rent						300		
Property Taxes						8		
Property Insurance						6		
Investment Repairs						16		
TOTAL CASH OVERHEAD COSTS						461		
TOTAL CASH COSTS/ACRE						11,193		
NON-CASH OVERHEAD:								
		Per Producing Acre		Annual Cost Capital Recovery				
Buildings		220		16		16		
Fruit Stand		120		16		16		
Shop/Field Tools		200		27		27		
Irrigation System -Lateral Lines		236		56		56		
Equipment		694		77		77		
TOTAL NON-CASH OVERHEAD COSTS		1,469		193		193		
TOTAL COSTS/ACRE						11,387		

UC COOPERATIVE EXTENSION
Table 2. COSTS and RETURNS PER ACRE to PRODUCE STRAWBERRIES
 SAN JOAQUIN VALLEY 2004

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Fresh Strawberries (Fruit Stand) 12 lb tray	750	tray	10.00	7,500	
Freezer Market lb	21,000	lb	0.28	5,880	
TOTAL GROSS				13,380	
OPERATING COSTS					
Custom:					
Land Prep	1.00	acre	100.00	100	
Fumigate-Solid 1X/2 Yr	0.50	acre	1,800.00	900	
Plastic retrieve/dump 1X/2 Yr	0.50	acre	65.00	33	
Make Beds 52"	1.00	acre	100.00	100	
Materials:					
T-Tape (dripline)	10,060.00	foot	0.02	151	
Mulch 52" 1mil	10,000.00	foot	0.02	210	
Trays (holds 12, 1 pint baskets)	750.00	each	0.20	150	
Baskets (pint)	9,000.00	each	0.02	162	
Dump Fee (mulch & dripline)	600.00	lb	0.02	12	
Water:					
Water Pumped	36.00	acin	4.83	174	
Plants:					
Strawberry Plants	21,110.00	each	0.07	1,478	
Fertilizer:					
UN32	302.50	lb	0.16	48	
15-15-15 (bagged)	100.00	lb	0.20	20	
Fungicide:					
Rovral 4F	2.00	pint	26.60	53	
Topsin M	1.00	lb	22.69	23	
Insecticide:					
Acramite 50WS	0.75	lb	87.69	66	
Malathion 8	2.00	pint	4.96	10	
Dipel DF	1.00	lb	13.55	14	
Assessment:					
Strawberry Fresh (\$0.045/tray)	750.00	tray	0.05	34	
Strawberry Freezer (\$0.045/tray)	1,500.00	tray	0.05	68	
Labor (machine)	17.88	hrs	12.73	228	
Labor (non-machine)	642.68	hrs	9.72	6,247	
Fuel - Gas	24.98	gal	1.88	47	
Fuel - Diesel	19.37	gal	1.45	28	
Lube				11	
Machinery repair				25	
Interest on operating capital @ 6.89%				344	
TOTAL OPERATING COSTS/ACRE				10,732	
NET RETURNS ABOVE OPERATING COSTS				2,648	
Cash Overhead:					
Liability Insurance				17	
Office Expense				50	
Sanitation Fee				65	
Land Rent				300	
Property Taxes				8	
Property Insurance				6	
Investment Repairs				16	
TOTAL CASH OVERHEAD COSTS/ACRE				461	
TOTAL CASH COSTS/ACRE				11,193	

UC COOPERATIVE EXTENSION
Table 2 continued

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Buildings				16	
Fruit Stand				16	
Shop/Field Tools				27	
Irrigation System -Lateral Lines				56	
Equipment				77	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				193	
TOTAL COSTS/ACRE				11,387	
NET RETURNS ABOVE TOTAL COSTS				1,993	

UC COOPERATIVE EXTENSION
Table 3 MONTHLY CASH COSTS PER ACRE to PRODUCE STRAWBERRIES
 SAN JOAQUIN VALLEY 2004

Beginning AUG 03 Ending JUL 04	JUL 03	AUG 03	SEP 03	OCT 03	NOV 03	DEC 03	JAN 04	FEB 04	MAR 04	APR 04	MAY 04	JUNE 04	TOTAL
Cultural:													
Land Prep: Plow, Disc	100												100
Fumigate: Flat, Tarped, 1X/2 Yr	900												900
Fumigate: Plastic Retrieval/Landfill 1X/2Yr	33												33
Land Prep: List/Shape 52"beds	100												100
Irrigate: Install Drip Tape 1/bed	211												211
Irrigate: Trench for laterals/Connect drip	38												38
Plant: Punch Holes in Soil		20											20
Irrigate: (water & labor)	9	23	23	8	8		15	15	39	39	19		199
Plant: (includes replant)	1,915												1,915
Fertilize: through drip (UN32)			4	4	4		9	9	9	9			48
Weed: Hand			49	49	49		49	49					243
Mulch: Cut Runners (hand)				467									467
Fertilize: Beds (15-15-15)							25						25
Mulch: Mow Plants							9						9
Mulch: Rake Mowings into Furrow (hand)							87						87
Mulch: Lay Plastic Mulch							329						329
Mulch: Burn Holes in Plastic (hand)							146						146
Disease: Botrytis/Mildew (Rovral, Topsin)									88				88
Insect: Mite (Acrامة) Worms (Dipel) Lygus (Malathion)											101		101
Year End: Crop Removal												167	167
Pickup: Business Use	4	4	4	4	4	4	4	4	4	4	4	4	44
TOTAL CULTURAL COSTS	1,385	1,948	80	546	64	11	600	76	164	51	152	190	5,268
Harvest:													
Harvest- Fresh										382	676	382	1,440
Harvest- Freezer										778	1,341	778	2,897
Load/Haul- Freezer										57	103	57	217
Assessments												101	101
Sell Fresh @ Fruitstand										117	233	117	467
TOTAL HARVEST COSTS	0	0	0	0	0	0	0	0	0	1,333	2,354	1,434	5,121
Interest on operating capital	8	19	20	23	23	23	27	27	28	36	50	60	343
TOTAL OPERATING COSTS/ACRE	1,393	1,967	99	569	87	35	627	104	192	1,420	2,556	1,683	10,732
OVERHEAD:													
Liability Insurance				17									17
Office Expense	4	4	4	4	4	4	4	4	4	4	4	4	50
Sanitation Fee										65			65
Land Rent											300		300
Property Taxes							8						8
Property Insurance							5						5
Investment Repairs	1	1	1	1	1	1	1	1	1	1	1	1	15
TOTAL CASH OVERHEAD COSTS	5	5	5	22	5	5	19	5	5	71	305	5	461
TOTAL CASH COSTS/ACRE	1,398	1,973	105	591	93	40	646	109	198	1,490	2,862	1,689	11,193

UC COOPERATIVE EXTENSION
Table 4. RANGING ANALYSIS
 SAN JOAQUIN VALLEY 2004

COSTS PER ACRE AT VARYING YIELD TO PRODUCE STRAWBERRIES

Pounds per Acre:	15,000	18,000	21,000	24,000	27,000	30,000	33,000
	YIELD (trays & lbs/acre)						
Fresh Market 12 lb trays:	375	450	525	600	675	750	825
Freezer Market lbs :	10,500	12,600	14,700	16,800	18,900	21,000	23,100
OPERATING COSTS							
Cultural Cost	5,268	5,268	5,268	5,268	5,268	5,268	5,268
Harvest Freezer	1,448	1,738	2,028	2,317	2,607	2,897	3,186
Load/Haul Freezer	108	130	152	173	195	217	238
Harvest Fresh	720	864	1,008	1,152	1,296	1,440	1,584
Sell Fresh @ Fruitstand	467	467	467	467	467	467	467
Assessment Cost	51	61	71	81	91	101	111
Interest on operating capital	317	322	327	333	338	343	349
TOTAL OPERATING COSTS/ACRE	8,379	8,850	9,321	9,791	10,262	10,732	11,203
<i>Total Operating Costs/tray</i>	<i>0.77</i>	<i>0.68</i>	<i>0.61</i>	<i>0.56</i>	<i>0.52</i>	<i>0.49</i>	<i>0.47</i>
CASH OVERHEAD COSTS							
TOTAL CASH COSTS/ACRE	8,839	9,310	9,781	10,251	10,722	11,193	11,664
<i>Total Cash Costs/tray</i>	<i>0.81</i>	<i>0.71</i>	<i>0.64</i>	<i>0.59</i>	<i>0.55</i>	<i>0.51</i>	<i>0.49</i>
NON-CASH OVERHEAD COSTS							
TOTAL COSTS/ACRE	9,024	9,497	9,970	10,441	10,914	11,387	11,859
<i>Total Costs/tray</i>	<i>0.83</i>	<i>0.73</i>	<i>0.65</i>	<i>0.60</i>	<i>0.56</i>	<i>0.52</i>	<i>0.50</i>

NET RETURNS PER ACRE ABOVE OPERATING COSTS

\$/tray	\$/lb	YIELD (trays & lbs/acre)						
Fresh		375	450	525	600	675	750	825
	Freezer	10,500	12,600	14,700	16,800	18,900	21,000	23,100
7.00	0.20	-3,654	-3,180	-2,706	-2,231	-1,757	-1,283	-808
8.00	0.22	-3,069	-2,478	-1,887	-1,295	-704	-113	479
9.00	0.25	-2,379	-1,650	-921	-191	538	1,267	1,997
10.00	0.28	-1,689	-822	45	913	1,780	2,647	3,515
11.00	0.31	-999	6	1,011	2,017	3,022	4,027	5,033
12.00	0.34	-309	834	1,977	3,121	4,264	5,407	6,551
13.00	0.36	276	1,536	2,796	4,057	5,317	6,577	7,838

NET RETURNS PER ACRE ABOVE CASH COSTS

\$/tray	\$/lb	YIELD (trays & lbs/acre)						
Fresh		375	450	525	600	675	750	825
	Freezer	10,500	12,600	14,700	16,800	18,900	21,000	23,100
7.00	0.20	-4,114	-3,640	-3,166	-2,691	-2,217	-1,744	-1,269
8.00	0.22	-3,529	-2,938	-2,347	-1,755	-1,164	-574	18
9.00	0.25	-2,839	-2,110	-1,381	-651	78	806	1,536
10.00	0.28	-2,149	-1,282	-415	453	1,320	2,186	3,054
11.00	0.31	-1,459	-454	551	1,557	2,562	3,566	4,572
12.00	0.34	-769	374	1,517	2,661	3,804	4,946	6,090
13.00	0.36	-184	1,076	2,336	3,597	4,857	6,116	7,377

UC COOPERATIVE EXTENSION

Table 4. continued

NET RETURNS PER ACRE ABOVE TOTAL COSTS

\$/tray	\$/lb	YIELD (trays & lbs/acre)							
		Fresh	375	450	525	600	675	750	825
		Freezer	10,500	12,600	14,700	16,800	18,900	21,000	23,100
7.00	0.20		-4,299	-3,827	-3,355	-2,881	-2,409	-1,937	-1,464
8.00	0.22		-3,714	-3,125	-2,536	-1,945	-1,356	-767	-177
9.00	0.25		-3,024	-2,297	-1,570	-841	-114	613	1,341
10.00	0.28		-2,334	-1,469	-604	263	1,128	1,993	2,859
11.00	0.31		-1,644	-641	362	1,367	2,370	3,373	4,377
12.00	0.34		-954	187	1,328	2,471	3,612	4,753	5,895
13.00	0.36		-369	889	2,147	3,407	4,665	5,923	7,182

UC COOPERATIVE EXTENSION

**Table 5. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, and BUSINESS OVERHEAD COSTS
SAN JOAQUIN VALLEY 2004**

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
						Insur- ance	Taxes	
04	42HP 4WD Tractor	27,830	15	5,418	2,680	112	166	2,959
04	Blade Rear 3 pt 6'	1,012	15	97	102	4	6	111
04	Drip Line Machine Layer 1-52" Row	3,500	15	336	352	13	19	384
04	Fertilizer Drill 2-52" Row 9'	5,000	10	884	620	20	29	670
04	Mulch Machine 2-52" Rows	22,500	15	2,160	2,260	83	123	2,467
04	Mower 5'	3,500	15	336	352	13	19	384
04	Pickup Truck 1/2 Ton	28,000	7	10,621	3,800	131	193	4,124
04	Punch Machine 1 bed	5,000	15	480	502	19	27	548
04	Sprayer 20' boom	3,630	15	349	365	13	20	398
04	Tool Bar w/tools 5'	1,500	10	265	186	6	9	201
04	Truck 1 Ton #1	36,000	10	10,634	4,147	158	233	4,537
TOTAL		137,472		31,580	15,366	571	845	16,782
40% of New Cost *		54,989		12,632	6,146	229	338	6,713

*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	5,500	30		409	19	28	110	566
Fruit Stand	1,200	10		165	4	6	24	199
Lateral Lines	2,355	5		563	8	12	47	629
Shop/Field Tools	5,000	10		687	17	25	100	829
TOTAL INVESTMENT	14,055			1,824	48	70	281	2,222

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm		Price/ Unit	Total Cost
	Unit	Unit		
Land Rent	25	acre	300.00	7,500
Liability Insurance	25	acre	16.76	419
Office Expense	25	acre	50.00	1,250
Sanitation Fee	10	acre	65.40	654

UC COOPERATIVE EXTENSION
Table 6. HOURLY EQUIPMENT COSTS
 SAN JOAQUIN VALLEY 2004

Yr	Description	COSTS PER HOUR							Total Costs/Hr.
		Actual Hours Used	Capital Recovery	Cash Overhead		Operating			
				Insur- ance	Taxes	Repairs	Fuel & Lube	Total Oper.	
04	42HP 4WD Tractor	1,066	1.01	0.04	0.06	0.46	3.44	3.90	5.01
04	Blade Rear 3 pt 6'	100	0.41	0.02	0.02	0.00	0.00	0.00	0.45
04	Drip Line Machine Layer 1-52" Row	100	1.41	0.05	0.08	0.59	0.00	0.59	2.13
04	Fertilizer Drill 2-52" Row 9'	150	1.66	0.05	0.08	0.90	0.00	0.90	2.69
04	Mulch Machine 2-52" Rows	131	6.90	0.25	0.38	1.66	0.00	1.66	9.19
04	Mower 5'	133	1.06	0.04	0.06	1.05	0.00	1.05	2.21
04	Pickup 1/2 ton	285	5.33	0.18	0.27	1.37	5.40	6.77	12.55
04	Punch Machine 1 bed	60	3.35	0.12	0.18	0.37	0.00	0.37	4.02
04	Sprayer 20' boom	100	1.46	0.05	0.08	0.63	0.00	0.63	2.22
04	Tool Bar w/tools 5'	200	0.37	0.01	0.02	0.21	0.00	0.21	0.61
04	Truck 1 Ton #1	200	8.30	0.32	0.47	2.29	9.91	12.20	21.29

UC COOPERATIVE EXTENSION
Table 7. OPERATIONS WITH EQUIPMENT
 SAN JOAQUIN VALLEY 2004

Operation	Month	Equipment		Non-Machine Total Labor Hours/Acre	Material	Rate/ Broadcast Acre	Unit
		Tractor	Implement				
Cultural:							
Land Prep: Plow, Disc	July	Custom					
Fumigate: 1X/2 Yr	July	Custom					
Fumigate: Plastic Retrieval 1X/2 Yr	July	Custom					
Land Prep: List/Shape Beds	July	Custom					
Irrigation: Install Drip Tape	July	42HP 4WD	Drip Machine	2.00	Drip Tape	10,060.00	ft
Irrigation: Trench for Laterals	July	42HP 4WD	Tool Bar w/Furrow	3.00			
Irrigation: Trench/Connect Drip	July	42HP 4WD	Blade Rear	0.50			
Plant: Punch Holes in Soil	August	42HP 4WD	Punch Machine				
Irrigate	August			0.10	Water	1.00	acin
	August			0.10	Water	0.70	acin
	September			0.30	Water	4.20	acin
	October			0.30	Water	4.20	acin
	November			0.10	Water	1.40	acin
	December			0.10	Water	1.40	acin
	February			0.20	Water	2.80	acin
	March			0.20	Water	2.80	acin
	April			0.50	Water	7.00	acin
	May			0.50	Water	7.00	acin
	June			0.30	Water	3.50	acin
Plant: (includes replant)	August			45.00	Plants	21,110.00	each
Fertilize: through drip (UN32)	September				UN32	27.50	lb
	October				UN32	27.50	lb
	November				UN32	27.50	lb
	February				UN32	55.00	lb
	March				UN32	55.00	lb
	April				UN32	55.00	lb
	May				UN32	55.00	lb
Weed: Hand	September			5.00			
	October			5.00			
	November			5.00			
	February			5.00			
	March			5.00			
Crop Removal	June			6.00	Plastic Dumped	600.00	lb
Cut Runner/Hand	October			48.00			
Fertilize 15-15-15	January	42HP 4WD	Fertilizer Applicator		15-15-15	100.00	lb
Mow Plants	January	42HP 4WD	Mower				
Rake Mowings	January			9.00			
Lay Plastic Mulch	January	42HP 4WD	Mulch Machine	9.00	Mulch	10,000.00	ft
Burn Holes in Plastic	January			15.00			
Disease: Botrytis/Mildew	March	42HP 4WD	Sprayer/Boom		Rovral	2.00	pt
					Topsin	1.00	lb
Insects: Mite/Lygyus	May	42HP 4WD	Sprayer/Boom		Acramite	0.75	lb
					Malathion	2.00	pt
					Dipel	1.00	lb
Harvest: Fresh	April			31.30	Tray	187.00	each
					Basket	2,244.00	each
	May			53.50	Tray	375.00	each
					Basket	4,500.00	each
	June			31.30	Tray	188.00	each
					Basket	2,256.00	each

UC COOPERATIVE EXTENSION

Table 7. continued

Operation	Month	Equipment		Non-Machine	Material	Rate/ Broadcast	Unit
		Tractor	Implement	Total Labor Hours/Acre		Acre	
Harvest: Freezer	April			80.00			
	May			138.00			
	June			80.00			
Load/Haul: Freezer	April	Truck 1-ton		4.20			
	May	Truck 1-ton		7.30			
	June	Truck 1-ton		4.20			
Sell	April			12.00			
	May			24.00			
	June			12.00			