
UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2004

**SAMPLE COSTS TO PRODUCE
STRAWBERRIES**



**SOUTH COAST REGION– Ventura County
Oxnard Plain**

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INTRODUCTION

The sample costs to produce winter season strawberries in the South Coast Region – Ventura County 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 1 and 2.

The hypothetical farm operation, production practices, overhead, and calculations are described under assumptions. For additional information or explanation of the calculations, 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 winter season strawberries in the South Coast Region – Ventura County, Oxnard Plain. 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 for the production of strawberries vary by grower and region, which can result in significant cost differences. **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 farm consists of 70 contiguous acres – 65 rented acres and five acres owned by the grower. Strawberries are planted on 60 acres, and roads and irrigation system are on five acres. The grower owned five acres includes a shop and homestead.

Production Operating Costs

Land Preparation. Disking, plowing, subsoiling and land leveling are done by a custom operator. The ground is fumigated, after which the beds are listed, shaped and the plastic mulch laid. The operations are done on the entire length of the field. After laying the mulch, roads are made, using a tracklayer tractor with blade, to divide the field into smaller blocks 280 to 400 feet long.

Plant Establishment. Several strawberry varieties are available for planting in the area, but no specific variety is assumed in this study. Plants in the region are planted on beds with 60 to 68 inch spacing between bed centers. In this study, the grower plants on 64-inch beds at 4-rows per bed with a 14-inch plant spacing for a total of 29,495 plants per acre. Five percent of the plants will be replanted and are included in the plant population. Planting holes are punched in the plastic mulch on the bed using a mechanical punch machine. Plants are delivered to the edge of the blocks where planting labor gathers the plants in a bucket and places the strawberry plants in the punched holes.

Fertilization. A slow release fertilizer, 18-6-8, at 1,000 pounds per acre is drilled preplant in the bed using a fertilizer drill with bed shaper. Growers may apply various fertilizers during the growing season through the drip system or as a foliar spray. Some fertilizers that may be applied are CAN 17 (17-0-0-8Ca), which is used in this study, and CN9 for nitrogen and calcium, Thiocal for calcium and sulfur, 0-10-10 for phosphorous and potassium, and minor nutrient fertilizers, such as zinc and iron.

Irrigation. The grower rents sprinkler pipe for the preplant and establishment sprinkler irrigations. Prior to listing, the field is sprinkler irrigated for 12 hours. Two men plus the tractor driver lay and pickup the pipe. A tape-layer machine is used to bury two drip-lines per bed. After the field is divided into blocks, lateral lines are buried at the edge of the field, then connected to the drip lines and tested for leaks. The field is preirrigated using the drip system. Following planting, sprinkler pipe is laid out and the field is sprinkled two-hours per day for 15 days. Two irrigators manage the sprinkler and drip irrigation. From December through June, the field is drip irrigated as necessary during the harvest portion of the season, every three to four days. Effective rainfall is not taken into account, therefore, a total of 28 acre-inches including the preplant irrigations are applied.

Water. The cost of the irrigation water is \$7.50 per acre inch (\$90 per acre-foot). The cost is a typical water cost paid by the growers and can be either district water charges and/or pumping costs. Water costs varied within the region, depending upon district water charges and/or assessments, pumping depth and horsepower.

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. The pesticide program shown in Table A represents a typical program for the region. Inputs cited in this report are based on grower surveys and the pesticide use reports, and are not recommendations. 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 and are an added cost. The adjuvants in this study are not included as a cost in the applications. 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 preplant fumigation. Currently 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. The grower furnishes two additional men to shovel and seal the plastic. The five men can do approximately 1.5 to 2 acres per hour. The grower can incur additional costs, which are not included in this study of \$10 to \$25 per acre to obtain the fumigation permit. These costs include field measuring, field maps and fumigation layout, obtaining permission from nearby residents, and meeting with county representatives.

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 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>.

MONTH	DISEASE			INSECTS		
	Mildew	Botrytis	Anthraco	Mites	Worms	Whitefly
Oct						
Nov	Procure				Danitol + Lorsban	Admire
Dec	Thiolux		Abound			
Dec	Thiolux	Captan + Elevate				
Dec				Persimilis		
Jan				Persimilis		
Jan	Procure	Switch	Switch			
Jan	Pristine	Pristine	Pristine	Acramite		
Feb	Thiolux	Captan + Elevate				
Feb	Procure	Switch				
Mar		Pristine				
Mar	Thiolux	Captan + Elevate				
Apr	Procure	Switch			Success	
Apr	Thiolux	Captan			Success	
May		Captan			Danitol + Success	
May	Thiolux	Captan + Elevate			Xentari	
Jun	Thiolux				Xentari	
Jun	Thiolux	Captan				
RATES PER ACRE in study: (Not Recommendations - See label or PCA)						
	Abound	14 oz		Admire	2 pt	
	Captan	3 lb		Danitol	12 oz	
	Elevate	1.5 lb		Lorsban	1 pt	
	Pristine	23 oz		Xentari	1 lb	
	Procure	0.5 lb		Persimillis	25,000 ea	
	Switch	14 oz				
	Thiolux	3 lb				

Grower costs for the drip method using Inline fungicide/nematicide and chloropicrin material and application 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 from November through June. Although weeding times vary by grower and month, the study assumes that weeding will take 62 hours per acre over the 7 months. Weeding costs from grower surveys ranged from \$300 to \$700 per acre.

Diseases. Powdery mildew (*Sphaerotheca macularis*), Botrytis fruit rot (*Botrytis cinerea*), and Anthracnose (*Colletotrichum actatum*) are the diseases treated in this study. Treatments are combined with the insect control. Fungicide treatments are made every 12 to 16 days through mid June (see Table A.). All treatments are grower applied.

Insects. Two-spotted spider mite (*Tetranychus urticae*), beet armyworm (*Spodoptera exigua*), cutworm (*Agrotis ipsilon*) and greenhouse, iris, and strawberry whiteflies (*Trialeurodes vaporariorum*, *Aleyrodes spiroeoides*, *Trialeurodes packardi*) are the insects controlled. Mites are controlled with the beneficial insect persimilis (*Phytoseiulus persimilis*) early in the season (December to early January), followed by a miticide (Acramite) application in late January. Danitol, Lorsban and Success insecticides are applied for armyworm and cutworm control, and Xentari is applied later in the season as a tank mix with the fungicides for armyworm control. The insecticide treatments are shown in Table A.

Harvest. The crop is harvested from January through mid-July with peak harvest in April and May. The early harvested strawberries go to fresh market and as other growing areas begin production, the growers shift to the freezer market. In this study the percent by weight of the crop harvested each month is shown in Table B. During harvest, the grower runs three 30 man crews with a general foreman for crew supervision, one field checker to check the field for proper picking, and one picking card puncher per crew to count the boxes picked by each picker. For fresh market the picker pushes a picking cart that holds a fiberboard tray and eight one-pound containers. The picker picks the ripe strawberries by hand and places them in the container/trays. Picking rate per picker ranges from 3 trays per hour early and late in the season and 5 to 8 trays per hour during the peak harvest. For the freezer market, the picker places an 18-pound plastic tray on the picking cart. The grower purchases the fresh market trays and the processor furnishes the freezer trays. (See Labor for picking costs). The grower uses two one-ton flatbed trucks that holds two to three pallets at 110 trays per pallet or 330 to 360 fresh market trays or 180 freezer trays per load. One truck driver delivers the strawberries to the cooler or freezer; one truck loader stacks the boxes on the truck. The truck driver takes about an hour per load to deliver the filled trays, and for the freezer, the driver will pick up the empty freezer trays. In addition, the grower will have at least one tractor, trailer, and toilet in the field. During the last couple of years, a few growers are using combine harvesting, where the picker puts full trays on the belt in front of them, one person runs the combine, one stacker stacks the trays on pallets, that are unloaded at the end of the field with a forklift. The combine picking costs are not shown in the study.

Table B. Percent Crop Harvested by Month based on pounds

	Jan	Feb	Mar	Apr	May	June	July
Fresh % (68%)	3	6	15	24	20		
Freezer % (32%)					12	17	3

Source: Processing Strawberry Advisory Board Crop Trend Report 2001-2003

Yields. Strawberry yields are measured in trays per acre for fresh and freezer market. Various tray weights are used to convert the yields to weight per acre. The standard consumer tray holds 8 x 1-pound containers (clamshells) and ranges from 8.5 to 10.0 pounds per tray. There are other tray arrangements with different size containers as well as the former standard tray containing 12 1-pint containers, which ranged from 10.5 to 12 pounds per tray. The weight used in this study is 9.5 pounds per tray for fresh market and 18 pounds per tray for freezer strawberries. Freezer trays delivered to the cooler usually weigh 18 to 20 pounds. Total per acre yield in this study is 57,000 pounds with 68% or 38,760 pounds (4,080 trays) delivered to fresh market and 32% or 18,240 pounds (1,013 trays) delivered to the freezer. The yield in this study is the 2001-2003 average yield for the Oxnard area (2003 Processing Strawberry Board). Average per acre yields by year for Ventura County are shown in Table C.

Table C. YIELDS and RETURNS¹

Year	Acres	FRESH		FREEZER		% Fresh
		Tray/ac ²	\$/tray	Tray/ac ³	\$/tray	
98	5,776	2,816	8.22	1,418	5.16	57
99	6,352	3,156	8.61	1,340	5.65	61
00	7,591	2,555	7.84	1,141	3.99	60
01	7,777	2,952	8.43	1,000	4.79	66
02	8,582	3,134	9.09	1,052	5.91	67

¹Ag Commissioner Crop Report-VenturaCounty ²12lb ³18lb

Returns. Based on average weighted returns from 2001 to 2003, the grower FOB returns are \$8.78 per 12-pound tray for fresh market and \$5.58 per 18-pound tray for freezer market. Fresh market returns less selling commission and cooling costs equals a payment to the grower of \$7.46 per tray. Strawberry prices are based on trays and not weight, therefore the \$7.46 tray price is used in this study to provide a basis for a range of yields and prices shown in Table 4. Average grower returns as reported by the Agricultural Commissioner for the last five years are shown in Table C. Fresh market prices vary during the harvest season. Typically prices are the highest in the Ventura area at the beginning of the season and decline as other areas come into production.

Assessments. The grower pays \$.045 per tray to the Strawberry Commission for research and marketing. Fresh market assessment is per tray (9.5 lbs in this study) and the freezer assessment on a 14-pound tray.

Year-end Cleanup. After last day of harvest, the plants are mowed, then 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. The disking cost in this study is included with land preparation costs.

Labor. Labor rates of \$12.06 per hour for machine operators and \$9.38 for general labor includes payroll overhead of 34%. The basic hourly wages are \$9.00 for machine operators and \$7.00 for general labor. Pickers are often paid a base pay plus piecework, or straight piecework depending on the time of harvest and if machine or non-machine harvest. In this study, picker pay is calculated using the field labor rate. The overhead includes the employers' share of federal and California state payroll taxes, workers' compensation insurance for strawberry crops (code 0079), 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. These costs include property taxes, interest on operating capital, office expense, liability and property insurance, sanitation services, and equipment repairs. 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 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 \$516 for the entire farm.

Office Expense. Office and related business expenses taken from grower budgets/actuals and are approximated at \$450 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, utilities except pumping costs, and miscellaneous expenses.

Sprinkler Pipe. Sprinklers are rented for approximately three months during land preparation through plant establishment. The majority of growers supplying information showed a rental cost of \$250 per acre.

Land Rent. The 65 acres are rented for cash at \$2,500 per acre or \$2,708 per producing acre. The rented land includes the irrigation system. The landlord maintains the irrigation system.

Sanitation Services. Sanitation services provide portable toilets with washing equipment and cost the farm \$7,500 annually or \$125 per producing acre. The cost is derived from grower budgets/actuals.

Supervisor/Management Salaries. Grower input cost for ranch supervision averaged \$450 per acre. Wages for management are not included as a cash cost. Returns above total costs are considered a return to management and risk.

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

Non-Cash Overhead

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

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

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

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

Interest Rate. The interest rate of 6.23% 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. Open irrigated and row-crop land values in the region range from \$32,000 per acre to \$53,000. Land suitable for berries appears to be on the higher price land. 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. Two drip lines are buried in each bed prior to planting. The lateral lines have a 3-year life and the drip lines are an annual expense. The system is based on one 75 horsepower electric pump lifting 30 acre-

inches from a water level depth of 120 feet. The pump and 300-foot deep well 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
 SOUTH COAST REGION- Ventura County 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: Disc, Plow, Subsoil, Level	0.00	0	0	0	450	450	
Irrigate: Sprinkle/Layout, Pickup Pipe	2.00	179	9	45	0	233	
Plant: List Beds	0.16	2	1	0	0	4	
Plant: Shape Beds 2X	0.26	4	3	0	0	6	
Fertilize: Preplant (18-6-8)	0.54	8	5	550	0	563	
Irrigation: Install Drip Tape 2 line/bed	1.25	27	8	253	0	288	
Plant: Lay Mulch	1.89	63	9	349	0	421	
Fumigation: Fumigate/Pickup Tarp	3.00	28	0	0	1,775	1,803	
Plant: Cut/Grade Roads/Maintain Roads	2.00	29	17	0	0	46	
Irrigation: Lay Laterals/Connect Drip	0.08	109	1	0	0	110	
Irrigation: Irrigate-Drip	13.00	122	0	165	0	287	
Plant: Punch Holes	0.69	10	3	0	0	13	
Plant: Transplant	49.55	465	0	2,065	0	2,529	
Plant: Roll Plants	0.20	3	1	0	0	4	
Fertilize: Various (CAN 17) dripline	0.00	0	0	29	0	29	
Insect: White Fly (Admire) dripline	0.15	1	0	212	0	214	
Disease: Mildew. Insect: Worm	2.92	42	19	127	0	188	
Disease: Mildew, Botrytis, Anthracnose	1.17	17	8	117	0	142	
Insect: Predatory Mite 2X	2.40	23	0	325	0	348	
Disease: Mildew, Botrytis, Anthrac. Insect: Mite	1.17	17	8	235	0	259	
Disease: Mildew, Botrytis	2.33	34	15	304	0	353	
Disease: Mildew, Botrytis. Insect: Worm	2.33	34	15	333	0	382	
Weed: Hand	62.00	582	0	0	0	582	
Cut Mulch Prior to Harvest/Haul	0.31	145	2	0	6	153	
Year-end: Field Cleanup	0.53	101	4	0	56	162	
TOTAL CULTURAL COSTS	149.93	2,044	129	5,108	2,287	9,567	
Harvest:							
Harvest/Record Fresh	714.75	6,704	0	6,324	0	13,028	
Load/Haul Fresh	16.68	190	41	0	0	231	
Harvest Freezer/Record/Haul	359.82	3,395	25	0	0	3,420	
Strawberry Commission	0.00	0	0	229	0	229	
TOTAL HARVEST COSTS	1,090.45	10,289	66	6,553	0	16,908	
Interest on operating capital @ 6.83%						867	
TOTAL OPERATING COSTS/ACRE		12,333	195	11,661	2,287	27,342	
TOTAL OPERATING COSTS/TRAY*						5.37	
CASH OVERHEAD: (\$ per producing acre)**							
Liability Insurance						9	
Office Expense						450	
Sanitation Fee						125	
Land Rent (see Table 5)						2,708	
Pipe Rent						250	
Ranch Supervisor						450	
Property Taxes						20	
Property Insurance						14	
Investment Repairs						33	
TOTAL CASH OVERHEAD COSTS						4,058	
TOTAL CASH COSTS/ACRE						31,400	
TOTAL CASH COSTS/TRAY*						6.17	

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Table 1 continued

Operation	Operation	Cash and Labor Cost 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		819		73		73		
Fuel Tanks/Above Ground		58		5		5		
Shop Tools		211		21		21		
Harvest Carts 90		20		5		5		
Hand Tools		77		8		8		
Lateral Lines		267		100		100		
Equipment		2,102		222		222		
TOTAL NON-CASH OVERHEAD COSTS		3,553		433		433		
TOTAL COSTS/ACRE						31,834		
TOTAL COSTS/TRAY*						6.25		

*Includes 9.5 lb + 18 lb trays **See Table 5

UC COOPERATIVE EXTENSION
Table 2 COSTS and RETURNS PER ACRE to PRODUCE STRAWBERRIES
 SOUTH COAST REGION- Ventura County 2004

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Fresh Market	4,080	9.5 lb tray	7.46	30,437	
Freezer Market	1,013	18 lb tray	5.58	5,653	
TOTAL GROSS RETURNS	5,093			36,089	
OPERATING COSTS					
Custom:					
Land Prep: Disc, Plow, Rip, Level	1.00	acre	450.00	450	
Fumigant Tarp Pickup/Discard	1.00	acre	125.00	125	
Fumigate - Solid	1.00	acre	1,650.00	1,650	
Plastic Mulch Discard - Dump Fee	1.10	acre	56.00	62	
Water:					
Water	28.00	acin	7.50	210	
Fertilizer:					
18-6-8 Slow Release	1,000.00	lb	0.55	550	
CAN 17 (17-0-0)	42.00	lb N	0.68	29	
Materials:					
T-Tape	16,845.00	foot	0.02	253	
Mulch 1.25m	350.00	lb	0.86	301	
Mulch Pins	4,000.00	each	0.01	48	
Tray with 8 Clamshells	4,080.00	each	1.55	6,324	
Plants:					
Strawberry Plants	29,495.00	each	0.07	2,065	
Fungicide:					
Procure	32.00	oz	4.00	128	
Abound	14.00	floz	2.59	36	
Captan 50W	24.00	lb	4.05	97	
Thiolux	30.00	lb	0.90	27	
Elevate 50 WDG	6.00	lb	42.45	255	
Switch 62.5 WB	42.00	oz	4.27	179	
Pristine	46.00	oz	2.40	110	
Beneficial Insects:					
Persimilis (Predatory Mites)	50.00	thou	6.50	325	
Insecticide:					
Admire 2 Flowable	32.00	floz	6.63	212	
Acramite 50WS	1.00	lb	87.69	88	
Success	15.00	floz	6.60	99	
Danitol	24.00	floz	1.62	39	
Lorsban 4E	1.00	pt	6.86	7	
Xentaria	3.00	lb	16.80	50	
Assessment:					
Strawberry Fresh (9.5 lb tray)	4,080.00	tray	0.05	184	
Strawberry Freezer (14 lb tray equivalent)	1,013.00	tray	0.05	46	
Labor (machine)	30.26	hrs	12.06	365	
Labor (non-machine)	1,275.90	hrs	9.38	11,968	
Fuel - Gas	25.31	gal	1.88	48	
Fuel - Diesel	59.96	gal	1.45	87	
Lube				20	
Machinery repair				40	
Interest on operating capital @ 6.89%				867	
TOTAL OPERATING COSTS/ACRE				27,342	
TOTAL OPERATING COSTS/TRAY				5.37	
NET RETURNS ABOVE OPERATING COSTS				8,747	

UC COOPERATIVE EXTENSION

Table 2 continued

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
CASH OVERHEAD COSTS (see Table 5):					
Liability Insurance				9	
Office Expense				450	
Sanitation Fee				125	
Land Rent				2,708	
Pipe Rent				250	
Ranch Supervisor				450	
Property Taxes				20	
Property Insurance				14	
Investment Repairs				33	
TOTAL CASH OVERHEAD COSTS/ACRE				4,058	
TOTAL CASH COSTS/ACRE				31,400	
TOTAL CASH COSTS/TRAY				6.17	
NON-CASH OVERHEAD COSTS (see Table 5):					
Buildings				73	
Fuel Tanks/Above Ground				5	
Shop Tools				21	
Harvest Carts 90				5	
Hand Tools				8	
Lateral Lines				100	
Equipment				222	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				433	
TOTAL COSTS/ACRE				31,834	
TOTAL COSTS/TRAY				6.25	
NET RETURNS ABOVE TOTAL COSTS				4,256	
NET RETURNS/TRAY				0.84	

UC COOPERATIVE EXTENSION
Table 3 MONTHLY CASH COSTS PER ACRE to PRODUCE STRAWBERRIES
 SOUTH COAST REGION- Ventura County 2004

Beginning AUG 03 Ending JUL 04	AUG 03	SEP 03	OCT 03	NOV 03	DEC 03	JAN 04	FEB 04	MAR 04	APR 04	MAY 04	JUN 04	JUL 04	TOTAL
Cultural:													
Land Prep: Disc, Plow, Subsoil, Level	450												450
Irrigate: Sprinkle/Layout, Pickup Pipe		116		116									233
Plant: List Beds		4											4
Plant: Shape Beds 2X		6											6
Fertilize: Preplant (18-6-8)		563											563
Irrigation: Install Drip Tape 2 line/bed		288											288
Plant: Lay Mulch		421											421
Fumigation: Fumigate/Pickup Tarp		1,803											1,803
Plant: Cut/Grade Roads/Maintain Roads		46											46
Irrigation: Lay Laterals/Connect Drip		110											110
Irrigation: Irrigate-Drip			24		32	17	17	34	41	49	49	24	287
Plant: Punch Holes			13										13
Plant: Transplant			2,529										2,529
Plant: Roll Plants			4										4
Fertilize: Various (CAN 17) dripline				4	4	4	4	4	4	4			29
Insect: White Fly (Admire) dripline			214										214
Disease: Mildew. Insect: Worm				71							118		188
Disease: Mildew, Botrytis, Anthracnose					142								142
Insect: Predatory Mite 2X					174	174							348
Disease: Mildew, Botrytis, Anthrac. Insect: Mite						259							259
Disease: Mildew, Botrytis							195	158					353
Disease: Mildew, Botrytis. Insect: Worm									197	185			382
Weed: Hand				28		84	122	94	94	84	75		582
Cut Mulch Prior to Harvest/Haul						153							153
Year-end: Field Cleanup												162	162
TOTAL CULTURAL COSTS	450	3,357	2,785	219	352	691	338	290	336	322	242	186	9,568
Harvest:													
Harvest/Record Fresh						774	1,548	2,880	4,269	3,557			13,028
Load/Haul Fresh						14	29	51	74	62			231
Harvest Freezer/Haul/Record										1,060	1,748	612	3,420
Strawberry Commission Assessment												229	229
TOTAL HARVEST COSTS	0	0	0	0	0	788	1,577	2,931	4,343	4,680	1,748	841	16,908
Interest on operating capital	3	22	38	39	42	45	61	79	106	135	146	152	867
TOTAL OPERATING COSTS/ACRE	453	3,379	2,823	258	394	1,525	1,975	3,300	4,785	5,136	2,135	1,179	27,342
Cash Overhead (see Table 5):													
Liability Insurance						9							9
Office Expense	38	38	38	38	38	38	38	38	38	38	38	38	450
Sanitation Fee	10	10	10	10	10	10	10	10	10	10	10	10	125
Land Rent												2,708	2,708
Pipe Rent				250									250
Ranch Supervisor	38	38	38	38	38	38	38	38	38	38	38	38	450
Property Taxes									20				20
Property Insurance							14						14
Investment Repairs	3	3	3	3	3	3	3	3	3	3	3	3	33
TOTAL CASH OVERHEAD COSTS	88	88	88	338	88	97	102	88	108	88	88	2,796	4,058
TOTAL CASH COSTS/ACRE	541	3,467	2,911	596	482	1,622	2,077	3,388	4,894	5,224	2,224	3,975	31,401

UC COOPERATIVE EXTENSION
Table 4. RANGING ANALYSIS
 SOUTH COAST REGION- Ventura County 2004

COSTS PER ACRE AT VARYING YIELD TO PRODUCE STRAWBERRIES

Total Yield (lbs/acre):	53,000	55,000	57,000	59,000	61,000	63,000	65,000
	YIELD (trays/acre)						
68% Fresh Market 9.5 lb trays:	3,794	3,937	4,080	4,223	4,366	4,509	4,653
32% Freezer Market 18 lb trays:	942	978	1,013	1,049	1,084	1,120	1,156
OPERATING COSTS							
Cultural Cost	9,567	9,567	9,567	9,567	9,567	9,567	9,567
Harvest Cost	15,509	16,094	16,679	17,263	17,848	18,432	19,021
Assessment Cost	213	221	229	237	245	253	261
Interest on operating capital	841	854	867	880	893	906	919
TOTAL OPERATING COSTS/ACRE	26,130	26,736	27,343	27,948	28,554	29,159	29,769
<i>TOTAL OPERATING COSTS/TRAY</i>	<i>5.52</i>	<i>5.44</i>	<i>5.37</i>	<i>5.30</i>	<i>5.24</i>	<i>5.18</i>	<i>5.13</i>
Cash Overhead Costs/Acre	4,058	4,058	4,058	4,058	4,058	4,058	4,058
TOTAL CASH COSTS/ACRE	30,188	30,794	31,401	32,006	32,612	33,217	33,827
<i>TOTAL CASH COSTS/TRAY</i>	<i>6.37</i>	<i>6.27</i>	<i>6.17</i>	<i>6.07</i>	<i>5.98</i>	<i>5.90</i>	<i>5.82</i>
Non-Cash Overhead Costs/Acre	433	433	433	433	433	433	433
TOTAL COSTS/ACRE	30,621	31,227	31,834	32,439	33,045	33,650	34,260
<i>TOTAL COSTS/TRAY</i>	<i>6.47</i>	<i>6.35</i>	<i>6.25</i>	<i>6.15</i>	<i>6.06</i>	<i>5.98</i>	<i>5.90</i>

NET RETURNS PER ACRE ABOVE OPERATING COSTS

\$/tray		YIELD (trays/acre)						
Fresh*		3,794	3,937	4,080	4,223	4,366	4,509	4,653
	Freezer	942	978	1,013	1,049	1,084	1,120	1,156
5.22	4.86	-1,748	-1,434	-1,120	-805	-491	-176	134
5.97	5.22	1,436	1,870	2,305	2,740	3,174	3,609	4,040
6.71	5.58	4,583	5,136	5,689	6,243	6,796	7,350	7,898
7.46	5.94	7,767	8,440	9,113	9,788	10,461	11,135	11,804
8.21	6.30	10,952	11,745	12,538	13,333	14,126	14,920	15,709
8.95	6.66	14,098	15,010	15,922	16,835	17,747	18,660	19,568
9.70	7.02	17,283	18,315	19,347	20,380	21,412	22,446	23,474

NET RETURNS PER ACRE ABOVE CASH COST

\$/tray		YIELD (trays/acre)						
Fresh*		3,794	3,937	4,080	4,223	4,366	4,509	4,653
	Freezer	942	978	1,013	1,049	1,084	1,120	1,156
5.22	4.86	-5,806	-5,492	-5,178	-4,863	-4,549	-4,234	-3,924
5.97	5.22	-2,622	-2,188	-1,753	-1,318	-884	-449	-18
6.71	5.58	525	1,078	1,631	2,185	2,738	3,292	3,840
7.46	5.94	3,709	4,382	5,055	5,730	6,403	7,077	7,746
8.21	6.30	6,894	7,687	8,480	9,275	10,068	10,862	11,651
8.95	6.66	10,040	10,952	11,864	12,777	13,689	14,602	15,510
9.70	7.02	13,225	14,257	15,289	16,322	17,354	18,388	19,416

UC COOPERATIVE EXTENSION

Table 4. continued

NET RETURNS PER ACRE ABOVE TOTAL COST

\$/tray		YIELD (trays/acre)						
Fresh*		3,794	3,937	4,080	4,223	4,366	4,509	4,653
	Freezer	942	978	1,013	1,049	1,084	1,120	1,156
5.22	4.86	-6,239	-5,925	-5,611	-5,296	-4,982	-4,667	-4,357
5.97	5.22	-3,055	-2,621	-2,186	-1,751	-1,317	-882	-451
6.71	5.58	92	645	1,198	1,752	2,305	2,859	3,407
7.46	5.94	3,276	3,949	4,622	5,297	5,970	6,644	7,313
8.21	6.30	6,461	7,254	8,047	8,842	9,635	10,429	11,218
8.95	6.66	9,607	10,519	11,431	12,344	13,256	14,169	15,077
9.70	7.02	12,792	13,824	14,856	15,889	16,921	17,955	18,983

*Prices are assumed to be net to grower (FOB less cooling and sales commission)

UC COOPERATIVE EXTENSION
Table 5. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT,
 SOUTH COAST - Ventura County 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	2,958
04 55HP 2WD Tractor	32,269	15	6,282	3,107	130	193	3,431
04 75HP 4WD Tractor	45,000	15	8,761	4,333	182	269	4,784
04 85HP Crawler	45,000	15	8,761	4,333	182	269	4,784
04 90HP 4WD Tractor	46,750	10	13,809	5,385	205	303	5,893
04 Bed Shaper 2 64"R	8,460	15	812	850	31	46	927
04 Blade Rear 3 pt	1,012	15	97	102	4	6	111
04 Drip Tape Machine 1-64"R	3,500	15	336	352	13	19	384
04 Fertilizer Drill 1-64"R 5'	5,000	15	480	502	19	27	548
04 Knife-Sickle 64"	1,250	15	120	126	5	7	137
04 Lister 16'	1,977	15	190	199	7	11	217
04 Mower	3,500	15	624	339	14	21	374
04 Mulch Machine 1-64"R	6,500	15	624	653	24	36	713
04 Punch Machine 1-64"	5,000	15	480	502	19	27	548
04 Roller 8'	4,500	15	432	452	17	25	494
04 Sprayer 21' boom	3,630	15	349	365	13	20	398
04 Trailer-Pipe	2,150	20	112	188	8	11	207
04 Truck 1 Ton #1	36,000	10	10,634	4,147	158	233	4,537
04 Truck 1 Ton #2	36,000	10	10,634	4,147	158	233	4,537
TOTAL	315,328		68,955	32,761	1,299	1,922	35,982
40% of New Cost *	126,131		27,582	13,105	520	769	14,393

*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	49,162	20		4,367	166	246	983	5,762
Fuel Tanks/Above Ground	3,500	20	651	294	14	21	70	398
Hand Tools	4,595	15	460	461	17	25	92	595
Harvest Carts 90	1,170	5		279	4	6	23	312
Lateral Lines	16,008	3		6,014	54	80	534	6,682
Shop Tools	12,637	15	1,264	1,267	47	70	253	1,637
TOTAL INVESTMENT	87,072		2,375	12,682	302	447	1,955	15,387

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Land Rent	65	acre	2,500.00	162,500
Liability Insurance	70	acre	7.37	516
Office Expense	60	acre	450.00	27,000
Pipe Rent	60	acre	250.00	15,000
Ranch Supervisor	60	acre	450.00	27,000
Sanitation Fee	60	acre	125.00	7,500

UC COOPERATIVE EXTENSION
Table 6 HOURLY EQUIPMENT COSTS
 SOUTH COAST REGION- Ventura County 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	302.10	3.55	0.15	0.22	0.46	3.44	3.90	7.82
04 55HP 2WD Tractor	768.60	1.62	0.07	0.10	0.92	4.50	5.42	7.21
04 75HP 4WD Tractor	41.00	42.30	1.77	2.62	1.29	6.14	7.43	54.12
04 85HP Crawler	132.00	13.13	0.55	0.81	0.74	6.96	7.70	22.19
04 90HP 4WD Tractor	27.50	78.45	2.98	4.41	0.81	7.37	8.18	94.02
04 Bed Shaper 2 64"R	15.60	21.82	0.80	1.19	1.10	0.00	1.10	24.91
04 Blade Rear 3 pt	125.00	0.33	0.01	0.02	0.00	0.00	0.00	0.36
04 Drip Tape Machine 1-64"R	75.00	1.88	0.07	0.10	0.59	0.00	0.59	2.64
04 Fertilizer Drill 1-64"R 5'	32.20	6.23	0.23	0.34	0.84	0.00	0.84	7.64
04 Knife-Sickle 64"	16.60	3.02	0.11	0.16	0.16	0.00	0.16	3.45
04 Lister 16'	9.40	8.47	0.31	0.46	0.26	0.00	0.26	9.50
04 Lister 16'	9.40	8.47	0.31	0.46	0.26	0.00	0.26	9.50
04 Mulch Machine 1-64"R	113.20	2.31	0.09	0.20	0.48	0.00	0.48	3.08
04 Punch Machine 1-64"	41.40	4.85	0.18	0.26	0.37	0.00	0.37	5.66
04 Roller 8'	12.10	14.92	0.55	0.81	0.33	0.00	0.33	16.61
04 Sprayer 21' boom	595.00	0.25	0.01	0.01	0.63	0.00	0.63	0.90
04 Trailer-Pipe	120.00	0.63	0.03	0.03	0.02	0.00	0.02	0.71
04 Truck 1 Ton #1	170.70	9.72	0.37	0.55	2.29	9.91	12.20	22.84
04 Truck 1 Ton #2	162.10	10.23	0.39	0.58	2.29	9.91	12.20	23.40

UC COOPERATIVE EXTENSION
Table 7. OPERATIONS WITH EQUIPMENT
 SOUTH COAST REGION - Ventura County 2004

Operation	Month	Equipment		Non-Machine Total Labor Hours/Acre	Material	Rate/ Broadcast Acre Unit
		Tractor	Implement			
Cultural:						
Land Prep: Disk, Plow, Subsoil	August	Custom				
Plant: List Beds	September	90 HP 4WD	Lister			
Plant: Shape Beds 2X	September	90 HP 4WD	Bed Shaper 2 Row			
Plant: Lay Mulch	September	42 HP 4WD	Mulch Machine	3.80	Mulch Mulch Pins	350.00 lb 4,000.00 each
Plant: Cut/Grade Roads	September	85 HP Crawler	Blade			
Plant: Punch Holes in Mulch	October	42 HP 4WD	Punch Machine			
Plant: Transplant Strawberries	October			49.60	Plants	29,495.00 each
Plant: Roll Plants	October	55 HP 2WD	Roller			
Fumigate: Fumigate/Pickup Tarp	September	Custom		3.00	Fumigate Pickup Tarp	1,650.00 acre 125.00 acre
Irrigate: Sprinkle/Layout/Pickup Pipe	September	42 HP 4WD	Trailer - Pipe	8.00	Water	3.00 acin
	November	42 HP 4WD	Trailer - Pipe	8.00	Water	3.00 acin
Irrigate: Install Drip Tape	September	55 HP 4WD	Tape Machine	1.00	T-Tape	6,845.00 ft
Irrigate: Lay Laterals/Connect Drip	September	75 HP 4WD	Blade	11.50		
Irrigate: Drip	October			1.00	Water	2.00 acin
	December			1.00	Water	3.00 acin
	January			1.00	Water	1.00 acin
	February			1.00	Water	1.00 acin
	March			2.00	Water	2.00 acin
	April			2.00	Water	3.00 acin
	May			2.00	Water	4.00 acin
	June			2.00	Water	4.00 acin
	July			1.00	Water	2.00 acin
Fertilize: Preplant	September	75 HP 4WD	Fertilizer Drill		18-6-8	1,000.00 lb
Fertilize: through drip	November				CAN 17	6.00 lb N
	December				CAN 17	6.00 lb N
	January				CAN 17	6.00 lb N
	February				CAN 17	6.00 lb N
	March				CAN 17	6.00 lb N
	April				CAN 17	6.00 lb N
	May				CAN 17	6.00 lb N
Pest: White Fly (through drip)	October			0.20	Admire	32.00 floz
Pest: Mildew/Worm	November	55 HP 4WD	Sprayer		Procure	8.00 oz
					Danitol	12.00 floz
					Lorsban	1.00 pt
Pest: Mildew/Botrytis/Anthrac	December	55 HP 4WD	Sprayer		Thiolux	3.00 lb
	December	55 HP 4WD	Sprayer		Abound	14.00 floz
					Thiolux	3.00 lb
					Captan	3.00 lb
					Elevate	1.50 lb
Pest: Mites - Persimilis 2X	December			1.20	Persimilis	25,000.00 each
	January			1.20	Persimilis	25,000.00 each
Pest: Mildew/Botrytis/Anthrac/Mites	January	55 HP 4WD	Sprayer		Procure	8.00 oz
					Switch	14.00 oz
	January	55 HP 4WD	Sprayer		Pristine	23.00 oz
					Acramite	1.00 lb

UC COOPERATIVE EXTENSION
Table 7. continued

Operation	Month	Equipment		Non-Machine Total Labor Hours/Acre	Material	Rate/ Broadcast Acre Unit
		Tractor	Implement			
Cultural:						
Pest: Mildew/Botrytis	February	55 HP 4WD	Sprayer		Thiolux	3.00 lb
					Captan	3.00 lb
					Elevate	1.50 lb
	February	55 HP 4WD	Sprayer		Procure	8.00 oz
					Switch	14.00 oz
	March	55 HP 4WD	Sprayer		Pristine	23.00 oz
	March	55 HP 4WD	Sprayer		Thiolux	3.00 lb
					Captan	3.00 lb
					Elevate	1.50 lb
Pest: Mildew/Botrytis/Worm	April	55 HP 4WD	Sprayer		Procure	8.00 oz
					Switch	14.00 oz
					Success	5.00 floz
	April	55 HP 4WD	Sprayer		Thiolux	3.00 lb
					Captan	3.00 lb
Pest: Mildew/Boytritis/Worm	May	55 HP 4WD	Sprayer		Captan	3.00 lb
					Danitol	12.00 floz
					Success	5.00 floz
	May	55 HP 4WD	Sprayer		Thiolux	3.00 lb
					Captan	3.00 lb
					Elevate	1.50 lb
Pest: Mildew/Worm	June	55 HP 4WD	Sprayer		Xentaria	1.00 lb
					Thiolux	3.00 lb
	June	55 HP 4WD	Sprayer		Xentaria	1.00 lb
					Thiolux	3.00 lb
					Captan	3.00 lb
Weed: Hand	November			3.00		
	January			9.00		
	February			13.00		
	March			10.00		
	April			10.00		
	May			9.00		
	June			8.00		
Harvest: Cut Mulch prior to harvest/ & Haul	January	55 HP 4WD Truck - 1 Ton #1	Knife-Sickle	15.00	Dump Cost	6.00 acre
Harvest: Pick Fresh/Record	February			158.30	Trays	540.00 each
	March			158.30	Trays	900.00 each
	April			217.10	Trays	1,440.00 each
	May			180.90	Trays	1,200.00 each
Harvest: Load/Haul Fresh	February	Truck - 1 Ton #1 & #2		3.30		
	March	Truck - 1 Ton #1 & #2		3.30		
	April	Truck - 1 Ton #1 & #2		4.60		
	May	Truck - 1 Ton #1 & #2		3.80		
Harvest: Pick Freezer/Record/Haul	May	Truck - 1 Ton #1 & #2		110.90		
	June	Truck - 1 Ton #1 & #2		183.20		
	July	Truck - 1 Ton #1 & #2		64.70		
Year End: Field Cleanup	August	Truck - 1 Ton #1 55 HP 4WD	Mower	10.00	Dump Cost	56.00 acre