
UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2004

**SAMPLE COSTS TO PRODUCE
STRAWBERRIES**



**CENTRAL COAST REGION
Monterey & Santa Cruz Counties**

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SAMPLE COSTS TO PRODUCE STRAWBERRIES
Central Coast Region - Monterey & Santa Cruz Counties - 2004

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INTRODUCTION

The sample costs to produce strawberries in the Central Coast Region - Monterey and Santa Cruz counties 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 Central Coast Region - Monterey and Santa Cruz counties. 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. The farm consists of 50 contiguous acres of rented land. Strawberries are being planted on 45 acres. The unplanted five acres are roads, open areas and irrigation system. The crop is farmed by the renter and is established on ground previously planted to vegetable and/or strawberry crops. For this study, the planted ground is assumed to be fairly flat. Some of the strawberry acres in the area are planted on rolling hills and will require erosion control, which is not included as a cost in this study.

Production Operating Costs

Land Preparation. The grower does a series of operations: discing 3X (X = number of passes over the land), subsoiling 2X, discing 2X, chiseling 2X, leveling 2X, discing 1X, and bed listing/shaping. The field is disced a total of 8X, chiseled 12 inches deep 4X, subsoiled or ripped 30 to 36 inches deep 2X. Beds 52-inches wide and 14-inches high are listed and shaped in one operation. In this study, it is assumed the grower owns the equipment, however, growers with this amount of acres will often rent a large tractor for land preparation or have the work done by a custom operator. Land preparation costs by a custom operator range from \$500 to \$650 per acre.

Plant Establishment. Several varieties are available for planting in the region, but no specific variety is assumed in this study. Bed width in the region ranges from 48 to 56 inches. In this study the strawberries are planted 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. Plastic mulch is laid on the bed prior to planting with a mulch-laying machine. Planting holes are punched in the plastic mulch with a mechanical punch machine. Plants are delivered to the edge of the blocks where planting labor gathers the plants in a bucket and then places the strawberry plants in the punched holes.

Fertilization. Slow release 18-8-13 fertilizer at 500 pounds per acre is drilled preplant in the bed using a fertilizer drill with bed shaper. Depending upon nutrient requirements during the growing season, growers may apply additional fertilizers through the drip system. Some fertilizers applied are CAN 17 (17-0-0-8Ca), CN9 for calcium and nitrogen, potassium nitrate for potassium and nitrogen, 0-0-52 for potassium, and minor nutrient fertilizers such as iron, zinc, and boron.

Irrigation. The grower rents sprinkler pipe for the two preplant and establishment sprinkler irrigations. Six men including the tractor driver layout and pickup the pipe. The drip tape is buried in the bed at two lines per bed. Ditches are made at the field edge with a tractor and blade to lay and bury the lateral lines. The drip tape is trimmed and connected to the lateral lines and the lines are tested for leaks. Beginning immediately after

planting, the plants are sprinkled one-hour per day for one week, then one and one-half hours on alternate days the following week. From March through September, the plants are irrigated two times per week through the drip lines. Effective rainfall is not taken into account; therefore a total of 36 acre-inches (including the preplant irrigations) are applied to the field.

Water. The water cost of \$14.00 per acre-inch (\$168/acre foot) is estimated based on growers who pump from their wells paying utility charges and those growers in the water management district that receive district water or who pump from their own wells, paying utility charges and a district assessment for groundwater depletion. Water cost will vary depending upon water district and well characteristics.

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 that is 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. 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.

TABLE A. DISEASE AND INSECT MATERIAL APPLICATIONS

MONTH	DISEASE			INSECTS		
	Botrytis	Mildew	Anthraco-nose	Mites	Worms	Lygus
March	Captan	Rally		Savey		
March				Persimillis		
April				Persimillis		
April		Quadris	Quadris		Dipel	
April	Elevate	Rally			Success	
May	Captan	Thiolux		Acramite	Dipel	Malathion
May		Quadris	Quadris			
June	Elevate	Rally		Acramite		Malathion
June	Captan	Thiolux				
July		Quadris				Dibrom
August		Thiolux		Danitol		Danitol
September		Thiolux				

RATES PER ACRE in study: (Not Recommendations - see label or your PCA)

Captan	4.0 lb	Dibrom	16.0 oz
Elevate	1.5 lb	Dipel	1.0 lb
Rally	5.0 oz	Malathion	2.0 pt
Thiolux	5.0 lb	Savey	6.0 oz
Quadris	12 floz	Success	5.0 floz
Acramite	1.0 lb	Persimillis	20,000 ea
Danitol	16.0 oz		

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>. 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 from December through September. Although weeding times vary by grower and month, the study assumes an average of 10.2 hours per acre per month over 10 months.

Diseases. Powdery mildew (*Sphaerotheca macularis*), Botrytis fruit rot (*Botrytis cinerea*), and Anthracnose (*Colletotrichum actatum*) are the diseases treated in this study. Treatments are combined (tank mixed) with the insect control applications. Fungicide treatments are made every 12 to 16 days through May and every 20 to 25 days thereafter ending in early September.

Insects. Two-spotted mite (*Tetranychus urticae*), beet armyworm (*Spodoptera exigua*), lygus (*Lygus hesperus*) and cutworm (*Agrotis ipsilon*) are the insects controlled. Treatments for insects are combined with the fungicide treatments, which are shown in Table A.

Harvest. The crop is harvested from April through early October with peak harvest in June and July. Based on weight, the percent of the crop harvested each month in this study is shown in Table B. The grower hires a crew foreman to supervise a 35-man crew early and late in the season and two 35-man crews during the peak season. The picker pushes a picking cart that holds a tray with eight one-pound containers down the furrow. The ripe strawberries are picked by hand and placed in the containers/tray. Other container types and sizes are used, but are not included in this study. 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. 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 two one-ton flatbed trucks that holds two to three pallets at 110 trays per pallet or 330 trays per load for delivery to the cooler. Trays per pallet will vary by container types. The truck driver takes about an hour per load to deliver the filled trays. The grower will have at least one tractor, one trailer, and one toilet in the field. (See Labor for picking rates).

Table B. Percent Crop Harvested by Month

	April	May	June	July	Aug	Sept	Oct
Fresh %	5	12	25	25	18	12	2

Yields. The crop yield in this study for fresh market production is 5,500 trays per acre. Strawberry yields are measured in trays per acre. The standard consumer tray holds 8 x 1-pound containers 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. Over the years, various tray weights were used to convert the yields to weight per acre. Yields of 50,200 pounds per acre (5,500 trays) in this study is the 2001-2003 average yield for the Watsonville - Salinas area (2003 Processing Strawberry Board). Average county yields for total production over the last five years are shown in Table C.

Table C. YIELDS and RETURNS¹

YEAR	MONTEREY			SANTA CRUZ		
	ACRE	² tray/acre	\$/tray	ACRE	² tray/acre	\$/tray
98	6,540	4,900	6.19	2,716	4,400	6.05
99	6,864	3,743	8.47	3,458	5,090	6.20
00	6,990	5,388	6.05	4,580	5,048	5.47
01	6,941	5,356	7.45	3,500	4,113	8.23
02	6,980	5,068	6.41	3,586	4,267	7.02

¹Ag Commissioner Crop Report: Monterey, Santa Cruz counties ²12 lb

Returns. Based on average weighted returns from 2001 to 2003, the grower FOB returns are \$7.61 per tray for fresh market. Fresh market returns less selling commission and cooling costs equals a payment to the grower of \$6.45 per tray. Strawberry prices are based on trays and not weight, therefore the \$6.45 tray price is used in this study to provide a basis for a range of yields and prices for a 9.5-pound tray as shown in Table 4. Average county grower fresh market returns for the last five years are shown in Table C.

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 is on a 14-pound tray.

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 \$12.73 per hour for machine operators and \$9.72 for general labor includes payroll overhead of 34%. The basic hourly wages are \$9.50 for machine operators and \$7.25 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, 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 business expenses are calculated from strawberry grower budgets/actuals and are approximated at \$700 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, office and shop utilities, and miscellaneous expenses.

Sprinkler Pipe. Sprinklers are rented during land preparation through plant establishment. The typical grower cost is \$250 per acre.

Land Rent. The 50 acres are rented for cash at \$2,500 per acre or \$2,444 per producing 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 \$4,500 annually or \$100 per producing acre. The cost is derived from grower budgets/actuals.

Supervisor/Management Salaries. Grower input cost for ranch supervision averaged \$500 per acre. 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. Farm equipment on strawberry farms in the Central Coast Region is purchased new or used; this study shows the current purchase price for new equipment. The new purchase price is adjusted to 40% to indicate a mix of new and used equipment. Annual ownership costs are shown in Tables.

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 \$10,000 to \$38,000 for row crop 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 5-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
 CENTRAL COAST REGION- Monterey & Santa Cruz Counties 2004

Operation	Cash and Labor Cost per acre						Total Cost	Your Cost
	Operation Time (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent	Total Cost		
Cultural:								
Land Prep: Disc 8X	1.33	20	35	0	0	55		
Land Prep: Subsoil 2X	1.50	23	39	0	0	62		
Land Prep: Chisel 4X	0.60	9	15	0	0	24		
Land Prep: Level 2X (Triplane)	0.50	8	13	0	0	21		
Land Prep: List/Shape 52" beds	0.25	4	6	0	0	10		
Fertilize: Preplant	0.26	4	1	275	0	280		
Irrigate: Install Drip Tape 2/bed	2.00	31	10	302	0	342		
Irrigate: Grade Field Roads	0.01	0	0	0	0	0		
Irrigate: OpenTrench for laterals/Connect drip	0.10	6	0	0	0	7		
Plant: Lay Mulch	2.00	108	12	349	0	469		
Plant: Punch Holes	0.69	11	3	0	0	14		
Irrigate: Layout/Pickup Sprinkler Pipe3X	3.00	75	13	0	0	88		
Irrigate: Sprinkle	0.35	3	0	84	0	87		
Irrigate: Drip	12.06	117	0	420	0	537		
Plant: (includes replant)	45.31	440	0	1,478	0	1,918		
Plant: Roll Plants to Pack	0.20	3	1	0	0	4		
Fumigate: Flat	3.00	29	0	0	1,650	1,679		
Fumigate: Tarp Retrieval/Discard	0.00	0	0	0	65	65		
Weed: Hand	102.00	991	0	0	0	991		
Pest: Botrytis/Mildew/Mite	0.58	9	4	165	0	178		
Pest: Mites 2X (Persimillis)	2.40	23	0	260	0	283		
Pest: Botrytis/Mildew/Anthracnose/Worms	1.17	18	8	173	0	198		
Pest: Botrytis/Mildew/Anthracnose/Worms/Lygyus	1.17	18	8	170	0	196		
Pest: Botrytis/Mildew/Mite/Lygyus	1.17	18	8	206	0	232		
Pest: Mildew/Lygyus	0.58	9	4	51	0	64		
Pest: Mildew/Mite/Lygyus	0.58	9	4	1	0	43		
Pest: Mildew	0.58	9	4	5	0	17		
Fertilize: through drip	0.00	0	0	41	0	41		
Year End: Crop Removal	2.00	119	35	18	0	172		
TOTAL CULTURAL COSTS	185.39	2,115	223	4,026	1,715	8,080		
Harvest:								
Harvest	984.31	9,567	0	8,525	0	18,092		
Load/Haul	6.06	294	74	0	0	368		
Assessments	0.00	0	0	248	0	248		
TOTAL HARVEST COSTS	990.37	9,861	74	8,773	0	18,708		
Interest on operating capital @ 6.89%						964		
TOTAL OPERATING COSTS/ACRE		11,977	297	12,799	1,715	27,752		
Cash Overhead (per producing acre)								
Liability Insurance						11		
Office Expense						700		
Sanitation Fee						100		
Land Rent (\$2,200 per acre)						2,444		
Pipe Rent						250		
Ranch Supervisor						500		
Property Taxes						31		
Property Insurance						21		
Investment Repairs						36		
TOTAL CASH OVERHEAD COSTS						4,094		
TOTAL CASH COSTS/ACRE						31,846		

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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		Per Producing Acre			Annual Cost			
					Capital Recovery			
Buildings		1,092			97		97	
Hand Tools		102			10		10	
Shop Tools		281			28		28	
Harvest Carts 70		23			6		6	
Fuel Tanks/Above Ground		78			7		7	
Lateral Lines		222			53		53	
Equipment		3,724			383		383	
TOTAL NON-CASH OVERHEAD COSTS		5,523			584		584	
TOTAL COSTS/ACRE							32,431	

UC COOPERATIVE EXTENSION
Table 2 COSTS and RETURNS PER ACRE to PRODUCE STRAWBERRIES
 CENTRAL COAST REGION- Monterey & Santa Cruz Counties 2004

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	You Cost
GROSS RETURNS					
Fresh Market Strawberries (9.5 lb tray)	5,500.00	tray	6.45	35,475	
OPERATING COSTS					
Water:					
Water	36.00	acin	14.00	504	
Fertilizer:					
Scotts 18-8-13	500.00	lb	0.55	275	
CAN 17 (17-0-0-8Ca)	350.00	lb	0.12	41	
Materials:					
T-Tape	20,120.00	ft	0.02	302	
Mulch Pins	4,000.00	ea	0.01	48	
Mulch 1.25m	350.00	lb	0.86	301	
Tray/Container	5,500.00	ea	1.55	8,525	
Dump Fee	600.00	lb	0.03	18	
Plants:					
Strawberry Plants	21,110.00	each	0.07	1,478	
Fungicide:					
Captan 50W	12.00	lb	4.05	49	
Rally 40W	15.00	oz	4.90	74	
Quadris	36.00	floz	3.18	114	
Elevate 50WDG	3.00	lb	42.45	127	
Thiolux	20.00	lb	0.90	18	
Insecticide:					
Savey 50 DF	6.00	oz	20.69	124	
Dipel DF	2.00	lb	13.55	27	
Dibrom 8 Emulsive	16.00	floz	0.81	13	
Success	5.00	floz	6.60	33	
Acramite 50WS	2.00	lb	87.69	175	
Malathion 8	4.00	pt	4.96	20	
Danitol	16.00	floz	1.62	26	
Predatory Mites:					
Persimillis	40.00	thou	6.50	260	
Assessment:					
California Strawberry Commission (\$0.045/tray)	5,500.00	tray	0.05	248	
Contract:					
Fumigate - Solid	1.00	acre	1,650.00	1,650	
Fumigation Tarp Retrieval/Disposal	1.00	acre	65.00	65	
Labor (machine)	34.00	hrs	12.73	433	
Labor (non-machine)	1,187.65	hrs	9.72	11,544	
Fuel - Gas	36.95	gal	1.88	69	
Fuel - Diesel	95.36	gal	1.45	138	
Lube				31	
Machinery repair				58	
Interest on operating capital @ 6.89%				964	
TOTAL OPERATING COSTS/ACRE				27,752	
NET RETURNS ABOVE OPERATING COSTS				7,723	

UC COOPERATIVE EXTENSION

Table 2 continued

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
CASH OVERHEAD COSTS (per producing acre):					
Liability Insurance				11	
Office Expense				700	
Sanitation Fee				100	
Land Rent (\$2,200 per acre)				2,444	
Pipe Rent				250	
Ranch Supervisor				500	
Property Taxes				31	
Property Insurance				21	
Investment Repairs				36	
TOTAL CASH OVERHEAD COSTS/ACRE				4,094	
TOTAL CASH COSTS/ACRE				31,846	
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Buildings				97	
Hand Tools				10	
Shop Tools				28	
Harvest Carts 70				6	
Fuel Tanks/Above Ground				7	
Lateral Lines				53	
Equipment				383	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				584	
TOTAL COSTS/ACRE				32,430	
NET RETURNS ABOVE TOTAL COSTS				3,045	

UC COOPERATIVE EXTENSION
Table 3 MONTHLY CASH COSTS PER ACRE to PRODUCE STRAWBERRIES
 CENTRAL COAST REGION- Monterey & Santa Cruz Counties 2004

Beginning AUG 03	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	TOTAL
Ending OCT 04	03	03	03	03	03	04	04	04	04	04	04	04	04	04	04	04
Cultural:																
Land Prep: Disc 8X	21	35														55
Land Prep: Subsoil 2X		62														62
Land Prep: Chisel 4X		24														24
Land Prep: Level 2X (Triplane)		21														21
Land Prep: List/Shape 52" beds		10														10
Fertilize: Preplant		280														280
Irrigate: Install Drip Tape 2/bed		342														342
Irrigate: Grade Field Roads		0						0								0
Irrigate: Lay laterals/Connect drip		7														7
Plant: Lay Mulch		469														469
Plant: Punch Holes			14													14
Irrigate: Lay/Pickup Sprinkler Pipe 3X		59		29												88
Irrigate: Sprinkle		57		30												87
Irrigate: Drip			15					44	73	73	73	73	73	73	44	537
Plant: (includes replant)			1,918													1,918
Plant: Roll Plants to Pack			4													4
Fumigate: Flat		1,679														1,679
Fumigate: Tarp Retrieval/Discard		65														65
Weed: Hand					99	99	99	99	99	99	99	99	99	99		991
Pest: Botrytis/Mildew/Mite								178								178
Pest: Mites 2X (Persimillis)								142	142							283
Pest: Bot/Mil/Anthr/Worms									198							198
Pest: Bot/Mil/Anthr/Wrms/Lygus										196						196
Pest: Botrytis/Mildew/Mite/Lygus											232					232
Pest: Mildew/Lygus												64				64
Pest: Mildew/Mite/Lygus													43			43
Pest: Mildew														17		17
Fertilize: through drip								6	6	6	6	6	6	6		41
Year End: Crop Removal															173	173
TOTAL CULTURAL COSTS	21	3,110	1,950	60	99	99	99	468	518	373	409	241	221	195	216	8,080
Harvest:																
Harvest									1,367	2,377	4,147	4,050	3,227	2,377	547	18,092
Haul to Cooler									28	48	84	82	66	48	11	368
Assessments															248	248
TOTAL HARVEST COSTS									1,395	2,426	4,231	4,132	3,293	2,426	805	18,708
Interest on operating capital	0	18	29	30	31	33	35	38	48	63	89	114	134	148	154	964
TOTAL OPERATING COSTS/ACRE	15	3,128	1,980	89	131	132	134	506	1,960	2,862	4,730	4,488	3,647	2,768	1,175	27,752
OVERHEAD:																
Liability Insurance		11														11
Office Expense	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	700
Sanitation Fee	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	100
Land Rent (per producing acre)													2,444			2,444
Pipe Rent				250												250
Ranch Supervisor	42	42	42	42	42	42	42	42	42	42	42	42				500
Property Taxes						31										32
Property Insurance						21										21
Investment Repairs	3	3	3	3	3	3	3	3	3	3	3	3				36
TOTAL CASH OVERHEAD COSTS	98	109	98	348	98	151	98	98	98	98	98	98	2,498	53	53	4,095
TOTAL CASH COSTS/ACRE	113	3,238	2,078	437	229	283	232	604	2,058	2,960	4,828	4,586	6,145	2,822	1,229	31,847

UC COOPERATIVE EXTENSION
Table 4. RANGING ANALYSIS
 CENTRAL COAST REGION- Monterey & Santa Cruz Counties 2004

COSTS PER ACRE AT VARYING YIELD TO PRODUCE FRESH MARKET STRAWBERRIES

	YIELD (trays/acre)**						
	4,000	4,500	5,000	5,500	6,000	6,500	7,000
OPERATING COSTS/ACRE:							
Cultural Cost	8,080	8,080	8,080	8,080	8,080	8,080	8,080
Harvest Cost	13,426	15,104	16,782	18,460	20,139	21,817	23,495
Assessment	180	203	225	247	270	292	315
Interest on operating capital	843	883	924	964	1,005	1,045	1,086
TOTAL OPERATING COSTS/ACRE	22,529	24,270	26,011	27,751	29,494	31,234	32,976
<i>TOTAL OPERATING COSTS/Tray</i>	<i>5.63</i>	<i>5.39</i>	<i>5.20</i>	<i>5.05</i>	<i>4.92</i>	<i>4.81</i>	<i>4.71</i>
CASH OVERHEAD COSTS/ACRE							
TOTAL CASH COSTS/ACRE	26,624	28,365	30,106	31,846	33,589	35,329	37,071
<i>TOTAL CASH COSTS/Tray</i>	<i>6.66</i>	<i>6.30</i>	<i>6.02</i>	<i>5.79</i>	<i>5.60</i>	<i>5.44</i>	<i>5.30</i>
NON-CASH OVERHEAD COSTS/ACRE							
TOTAL COSTS/ACRE	27,208	28,949	30,690	32,430	34,173	35,913	37,655
<i>TOTAL COSTS/Tray</i>	<i>6.80</i>	<i>6.43</i>	<i>6.14</i>	<i>5.90</i>	<i>5.70</i>	<i>5.53</i>	<i>5.38</i>

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE*	YIELD (trays/acre)						
	4,000	4,500	5,000	5,500	6,000	6,500	7,000
\$/TRAY							
4.45	-4,729	-4,245	-3,761	-3,276	-2,794	-2,309	-1,826
5.45	-729	255	1,239	2,224	3,206	4,191	5,174
6.45	3,271	4,755	6,239	7,724	9,206	10,691	12,174
7.45	7,271	9,255	11,239	13,224	15,206	17,191	19,174
8.45	11,271	13,755	16,239	18,724	21,206	23,691	26,174
9.45	15,271	18,255	21,239	24,224	27,206	30,191	33,174
10.45	19,271	22,755	26,239	29,724	33,206	36,691	40,174

NET RETURN PER ACRE ABOVE CASH COST

PRICE*	YIELD (trays/acre)						
	4,000	4,500	5,000	5,500	6,000	6,500	7,000
\$/TRAY							
4.45	-8,824	-8,340	-7,856	-7,371	-6,889	-6,404	-5,921
5.45	-4,824	-3,840	-2,856	-1,871	-889	96	1,079
6.45	-824	660	2,144	3,629	5,111	6,596	8,079
7.45	3,176	5,160	7,144	9,129	11,111	13,096	15,079
8.45	7,176	9,660	12,144	14,629	17,111	19,596	22,079
9.45	11,176	14,160	17,144	20,129	23,111	26,096	29,079
10.45	15,176	18,660	22,144	25,629	29,111	32,596	36,079

NET RETURNS PER ACRE ABOVE TOTAL COST

PRICE*	YIELD (trays/acre)						
	4,000	4,500	5,000	5,500	6,000	6,500	7,000
\$/TRAY							
4.45	-9,408	-8,924	-8,440	-7,955	-7,473	-6,988	-6,505
5.45	-5,408	-4,424	-3,440	-2,455	-1,473	-488	495
6.45	-1,408	76	1,560	3,045	4,527	6,012	7,495
7.45	2,592	4,576	6,560	8,545	10,527	12,512	14,495
8.45	6,592	9,076	11,560	14,045	16,527	19,012	21,495
9.45	10,592	13,576	16,560	19,545	22,527	25,512	28,495
10.45	14,592	18,076	21,560	25,045	28,527	32,012	35,495

*Prices are assumed to be net to grower (FOB less cooling and sales commission) **9.5 lbs See text: **Yield**

UC COOPERATIVE EXTENSION
Table 5. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT,
and BUSINESS OVERHEAD COSTS
 CENTRAL COAST REGION- Monterey and Santa Cruz Counties 2004

ANNUAL EQUIPMENT COSTS

Yr Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
					Insur- ance	Taxes	
04 205HP Crawler	152,000	15	29,592	14,637	614	908	16,159
04 42HP 4WD Tractor #1	27,830	15	5,418	2,680	112	166	2,958
04 42HP 4WD Tractor #2	27,830	12	6,958	2,955	118	174	3,246
04 55HP 2WD Tractor	32,269	15	6,282	3,107	130	193	3,430
04 Blade Rear 3 pt 6'	1,012	15	97	102	4	6	111
04 Chisel - Spring 14'	6,163	15	592	619	23	34	676
04 Disk - Offset 14'	15,516	10	2,744	1,925	62	91	2,078
04 Drip Machine 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 Fume/Mulch Machine 2-52"Row	22,500	15	2,160	2,260	83	123	2,467
04 Lister/Shaper 2-52"Row	5,000	15	480	502	19	27	548
04 Mower	3,500	15	336	352	13	19	384
04 Punch Machine 1-52" Row	5,000	15	480	502	19	27	548
04 Ripper-5 Shank 14'	10,800	10	1,733	1,340	43	64	1,447
04 Roller 8'	4,500	15	432	452	17	25	493
04 Sprayer 20' boom	3,630	15	349	365	13	20	398
04 Trailer-Pipe	2,150	20	102	188	8	11	207
04 Triplane 15'	18,750	15	1,800	1,884	69	103	2,056
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	418,950		82,043	43,135	1,694	2,506	47,335
40% of New Cost *	167,580		32,817	17,254	678	1,002	18,934

*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	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 70	1,042	5		249	4	5	21	279
Lateral Lines Irrigation	10,000	5		2,389	34	50	200	2,673
Shop Tools	12,637	15	1,264	1,267	47	70	253	1,637
TOTAL INVESTMENT	80,936		2,375	9,026	282	417	1,619	11,343

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/		Price/ Unit	Total Cost
	Farm	Unit		
Land Rent	50	acre	2,200.00	110,000
Liability Insurance	50	acre	10.32	516
Office Expense	45	acre	700.00	31,500
Pipe Rent	45	acre	250.00	11,250
Ranch Supervisor	45	acre	500.00	22,500
Sanitation Fee	45	acre	100.00	4,500

UC COOPERATIVE EXTENSION
Table 6 HOURLY EQUIPMENT COSTS
 CENTRAL COAST REGION- Monterey & Santa Cruz Counties 2004

Yr Description	COSTS PER HOUR							
	Actual	Cash Overhead			Operating			Total
	Hours Used	Capital Recovery	Insurance	Taxes	Repairs	Fuel & Lube	Oper.	
04 205HP Crawler	207.10	28.27	1.19	1.75	2.48	19.84	22.32	53.53
04 42HP 4WD Tractor #1	374.80	2.86	0.12	0.18	0.46	3.44	3.90	7.06
04 42HP 4WD Tractor #2	133.10	8.88	0.35	0.52	0.47	3.44	3.91	13.66
04 55HP 2WD Tractor	288.80	4.30	0.18	0.27	0.92	4.50	5.42	10.17
04 Blade Rear 3 pt 6'	4.80	8.44	0.31	0.46	0.00	0.00	0.00	9.21
04 Chisel - Spring 14'	27.00	9.17	0.34	0.50	0.84	0.00	0.84	10.85
04 Disk - Offset 14'	60.00	12.83	0.41	0.61	1.67	0.00	1.67	15.52
04 Drip Machine 1-52"Row	90.00	1.56	0.06	0.09	0.59	0.00	0.59	2.30
04 Fertilizer Drill 2-52" Row 9'	11.80	21.05	0.67	1.00	0.9	0.00	0.90	23.62
04 Fume/Mulch Machine 2-52"Row	90.00	10.05	0.37	0.55	1.66	0.00	1.66	12.63
04 Lister/Shaper 2-52"Row	11.30	17.86	0.66	0.97	0.66	0.00	0.66	20.15
04 Mower	90.00	1.56	0.06	0.09	1.05	0.00	1.05	2.76
04 Punch Machine 1-52" Row	31.00	6.48	0.24	0.35	0.37	0.00	0.37	7.44
04 Ripper-5 Shank 14'	67.50	7.94	0.25	0.38	1.62	0.00	1.62	10.19
04 Roller 8'	9.10	19.89	0.73	1.09	0.33	0.00	0.33	22.04
04 Sprayer 20' boom	262.50	0.56	0.02	0.03	0.63	0.00	0.63	1.24
04 Trailer-Pipe	135.00	0.56	0.02	0.03	0.02	0.00	0.02	0.63
04 Triplane 15'	22.50	33.49	1.23	1.83	1.86	0.00	1.86	38.41
04 Truck 1 Ton #1	226.30	7.33	0.28	0.41	2.29	9.91	12.20	20.22
04 Truck 1 Ton #2	136.30	12.17	0.46	0.68	2.29	9.91	12.20	25.51

UC COOPERATIVE EXTENSION
Table 7. OPERATIONS WITH EQUIPMENT
 CENTRAL COAST - Monterey & Santa Cruz Counties

Operation	Month	Equipment		Non-Machine Total Labor Hours/Acre	Material	Rate/ Broadcast Acre Unit
		Tractor	Implement			
Cultural:						
Land Prep: Disk/Roll 8X	August	205 HP Crawler	Disk - Offset			
	September					
Land Prep: Subsoil 2X	September	205 HP Crawler	Ripper 5-Shank			
Land Prep: Chisel 4X	September	205 HP Crawler	Chisel - Spring			
Land Prep: Triplane 2X	September	205 HP Crawler	Triplane			
Land Prep: List/Shape Beds	September	205 HP Crawler	Lister/Shaper			
Irrigate: Layout/Pickup Pipe 3X	September	42 HP 4WD	Trailer - Pipe	2.00		3.00 acin
	November	42 HP 4WD	Trailer - Pipe	1.00		
Irrigate: Install Drip Tape	September	42 HP 4WD	Tape Machine		T-Tape	20,120.00 ft
Irrigate: Lay Laterals/Connect Drip	September	42 HP 4WD	Blade	0.50		
Irrigate: Sprinkle	September			0.10	Water	4.00 acin
	November			0.30	Water	2.00 acin
Irrigate: Drip	October			0.10	Water	1.00 acin
	March			1.50	Water	2.09 acin
	April			1.50	Water	4.14 acin
	May			1.50	Water	4.14 acin
	June			1.50	Water	4.14 acin
	July			1.50	Water	4.14 acin
	August			1.50	Water	4.14 acin
	September			1.50	Water	4.14 acin
	October			1.50	Water	2.07 acin
Irrigate: Grade Field Roads	March	42 HP 4WD	Blade			
Fertilize: Preplant	September	42 HP 4WD	Fertilizer Drill		18-8-13	500.00 lb
Fertilize: through drip	March				CAN 17	50.00 lb
	April				CAN 17	50.00 lb
	May				CAN 17	50.00 lb
	June				CAN 17	50.00 lb
	July				CAN 17	50.00 lb
	August				CAN 17	50.00 lb
	September				CAN 17	50.00 lb
Fumigate: Fumigate	September	Custom		3.00	Fumigate	1,650.00 acin
Fumigate: Discard Tarp	September	Custom				65.00 acre
Plant: Cut/Grade Roads	September	42 HP 4WD	Blade			
Plant: Lay Mulch	September	42 HP 4WD	Mulch Machine	8.00	Mulch	350.00 lb
					Mulch Pins	4,000.00 each
Plant: Punch Holes	October	42 HP 4WD	Punch Machine			
Plant: Transplant	October			45.30	Transplants	21,110 each
Plant: Roll Plants	October	42 HP 4WD	Roller			
Pest: Botrytis/Mildew/Mites	March	55 HP 4WD	Sprayer		Captan	4.00 lb
					Rally	5.00 oz
					Savey	6.00 oz
Pest: Mites - Persimilis 2X	March			1.20	Persimilis	20,000.00 each
	April			1.20	Persimilis	20,000.00 each
Pest: Botrytis/Mildew/Anthrac/Worms	April	55 HP 4WD	Sprayer		Quadris	12.00 floz
					Dipel	1.00 lb
	April	55 HP 4WD	Sprayer		Elevate	1.50 lb
					Rally	5.00 oz
					Success	5.00 floz
Pest: Botrytis/Mildew/Mites/Anthrac/ Worm/Lygyus	May	55 HP 4WD	Sprayer		Captan	4.00 lb
					Thiolux	5.00 lb
					Acramite	1.00 lb
					Dipel	1.00 lb
					Malathion	2.00 pt
	May	55 HP 4WD	Sprayer		Quadris	12.00 floz

UC COOPERATIVE EXTENSION

Table 7. continued

Operation	Month	Equipment		Non-Machine Total Labor Hours/Acre	Material	Rate/ Broadcast Acre Unit
		Tractor	Implement			
Cultural:						
Pest: Botrytis/Mildew/Mites/Lygyus	June	55 HP 4WD	Sprayer		Elevate	1.50 lb
					Rally	5.00 oz
					Acramite	1.00 lb
					Malathion	2.00 pt
	June	55 HP 4WD	Sprayer		Captan	4.00 lb
					Thiolux	5.00 lb
Pest: Mildew/Lygyus	July	55 HP 4WD	Sprayer		Quadris	12.00 floz
					Dibrom	16.00 floz
Pest: Mildew/Mite/Lygyus	August	55 HP 4WD	Sprayer		Thiolux	5.00 lb
					Danitol	16.00 floz
Pest: Mildew	September	55 HP 4WD	Sprayer		Thiolux	5.00 lb
Weed: Hand	December			10.20		
	January			10.20		
	February			10.20		
	March			10.20		
	April			10.20		
	May			10.20		
	June			10.20		
	July			10.20		
	August			10.20		
	September			10.20		
Harvest: Pick Fresh/Record	April			96.80	Trays	275.00 each
	May			139.30	Trays	660.00 each
	June			207.30	Trays	1,375.00 each
	July			188.70	Trays	1,430.00 each
	August			174.20	Trays	990.00 each
	September			139.30	Trays	660.00 each
	October			38.70	Trays	110.00 each
Harvest: Load/Haul Fresh	April	Truck - 1 Ton #1 & #2		2.00		
	May	Truck - 1 Ton #1 & #2		2.90		
	June	Truck - 1 Ton #1 & #2		4.40		
	July	Truck - 1 Ton #1 & #2		4.00		
	August	Truck - 1 Ton #1 & #2		3.70		
	September	Truck - 1 Ton #1 & #2		2.90		
	October	Truck - 1 Ton #1 & #2		0.80		
Year End: Field Cleanup	August	42 HP 4WD & Truck	Mower	6.00		
		- 1 Ton #1			Dump (600lb)	0.03 lb