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Bell Pepper Production: Sample Costs and Profitability Analysis

**Based on 1999 Data Collected in
Ventura County, California**

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This study presents sample costs of production for bell peppers developed in Ventura County, California, in 1999, but the methodology we used to analyze costs, profits, and investments can easily be modified to address individual situations in production areas throughout California. Tables 1 and 2 include a “Your cost” column where growers can enter their own costs for comparison with ours. Also note that because of rounding, the totals given in tables 1 through 6 may differ slightly from the sums of their constituent numbers.

We based our study on certain assumptions that we developed from production practice and cost information gathered from growers and agricultural institutions in the area. This is one of a series of six reports on vegetable crop production that are based on Ventura County data.

As a grower or other agriculture professional, you can benefit from this report in many ways. It can help you make production decisions, determine potential returns, prepare budgets, evaluate production loans, and analyze policies.

A discussion of the assumptions and calculation methods we used in this study is provided in the text. Cultural practice and cost data are presented in detail in six tables:

[Table 1. Costs per acre to produce bell peppers](#)

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Bell peppers are grown for both the fresh and processed markets. Market price sometimes determines how bell peppers are harvested. This study assumes that the costs of production are the same for fresh market and processed crops except for harvesting (picking and packing) and selling costs, crop prices, and yield.

STUDY ASSUMPTIONS

This report is based on a 1,300-acre vegetable farm, the average size of farm for the growers we interviewed. Most land used for vegetable crops in Ventura County produces two or more crops a year. Each crop is planted and harvested several times a year, so planting, harvesting, and selling of vegetable crops are year-round activities for growers, farm workers, and sellers.

We calculated our costs assuming that at least two crops are produced on each acre, resulting in a total of 2,600 acres of farmed land per year. For our study, the crops grown on the farm include broccoli, bell pepper, celery, spinach, loose-leaf lettuce, and cilantro (we have issued a report similar to this one for each of these crops). This crop mix is not present, of course, on every farm in Ventura County, but several farms in our interview pool did produce all six crops.

The growing period for each crop varies depending on time of planting. Consequently, production costs—particularly for irrigation, disease and pest management, and overhead—would be expected to vary. We based our study on an average growth period of minimum and maximum days. Prices used for materials, equipment, contract services, and labor wages (unless otherwise specified) are for the year 1999.

CULTURAL PRACTICES AND PRODUCTION INPUTS

Land preparation. Different types of fields and management preferences require different types of land preparation. Most growers in our interview pool performed several operations including multiple discing (five times in this study), ripping the soil (maybe twice) to break up any underlying compacted soil, plowing, leveling using a triplane, chiseling, furrowing, listing, and shaping beds. Preplant fertilizer was applied together with the listing before the ground was shaped and rolled into beds.

Stand establishment. Bell pepper is grown primarily in the southern desert valley, the south coast, the central coast, and the Central Valley areas of California. The primary varieties produced in Ventura County are Marathon and Excalibur, with some production of Indra, Bell Star, Galaxy, and King Arthur. All varieties have similar cultural, harvesting, and marketing requirements.

Transplanting rates vary depending on spacing. For this study, we assumed a rate of approximately 26,000 transplants per acre. A transplanted bed consists of two rows to the bed with bed centers 40 inches apart and transplants 12 inches apart within the row.

Weed management. If left unattended, weeds can become problematic during the course of bell pepper production. Many growers in Ventura County use pre-emergent herbicides. In this study, we assume that mechanical cultivation is the primary means of control for a wide range of grass and broadleaf weeds. Fields that appear to have serious weed infestations are often not used for bell pepper production.

Fertilization. As mentioned previously, preplant fertilizer of nitrogen (N), phosphorous, and potassium is in most cases applied together with the listing before the

ground is shaped and rolled into beds. Fertilizer applications during the growth period are mostly N and are applied via the drip irrigation system. N-Phuric, applied to prevent possible clogging of the drip system, also supplies the bell pepper plants with nitrogen. The amount and type of fertilizer we included in this study are based on an average of what most growers applied.

Irrigation. During root establishment, irrigation is applied via a sprinkler system. Growers can purchase or rent sprinkler irrigation systems. We calculated costs for this study based on ownership of an existing sprinkler irrigation system.

Growers can irrigate a field one portion at a time, moving pumps, pipes, and fittings manually from field to field. For this study, we assumed that sufficient pumps, pipes, and fittings are available to irrigate 430 acres at a time. Pipes are transported using a trailer and a tractor. Spreading the pipes takes 90 minutes of manual labor per acre. Removing pipes takes about the same amount of time.

After roots have been established, growers convert the irrigation to a drip system. Irrigation labor for inspection and maintenance of the system is estimated at about 30 minutes per acre per irrigation for sprinklers, and about 33 minutes per acre per irrigation for drip irrigation.

Energy use for pumping includes both diesel fuel and electric power, depending on the irrigation system. The amount of diesel and electricity consumption depends on pump horsepower (HP). In our study we used a 100 HP diesel pump and a 70 HP electric pump. We estimated that 102 gallons of diesel and about 571 kilowatts (KW) of electricity would be needed per acre during the production period of bell peppers.

The cost of water to irrigate crops varies greatly from region to region in Ventura County, and also depending on whether district or well water is used. The farm in this study is in the Oxnard Plains where growers use both well and district water. We calculated the water cost at \$82 per acre-foot. This rate is a weighted average for pumping costs and district charges assuming that one-third of the water comes from wells and the remaining two-thirds from districts.

Pest and disease management. Insects that can affect bell pepper production include flea beetles (*Epitrix* and *Phyllotreta* spp.), cutworms (*Agrotis* and *Peridroma* spp.), and wireworms (*Limonius* spp.). Later in the season, beet armyworm (*Spodoptera exigua*), tomato fruitworm (*Heliothis zea*), and pepper weevil (*Anthonomus eugenii*) can damage foliage as well as fruit. Most of these pests can be treated at the larval stage. Growers usually rotate insecticides in order to slow potential pest resistance. Written recommendations from State of California-licensed pest control advisors are required for pesticide use. For information and pesticide use permits, contact your county Agricultural Commissioner's office. You can also find pest management information from the University of California on the UC Statewide Integrated Pest Management Project website, <http://www.ipm.ucdavis.edu>. Growers also use biological control agents to control diamond moth and some other pests.

Depending on the region, a number of diseases may infect bell peppers during any phase of growth. The most common diseases affecting bell pepper in Ventura County are Phytophthora root rot (caused by *Phytophthora capsici*) and viruses such as alfalfa mosaic virus (AMV), tobacco mosaic virus (TMV), pepper mottle virus (PeMV), cucumber mosaic virus (CMV), and powdery mildew. No effective chemical control measures are available for these diseases; their control depends primarily on proper irrigation management. This study assumes that some fungicide is used as a preventive measure.

HARVEST AND SELL

Because bell peppers are grown for both fresh and processed markets, the market price sometimes determines how bell peppers are harvested. In this study, we assumed that 60 percent of the crop would be packed for fresh market and 40 percent processed (based on 1997 and 1998 Ventura County Agricultural Commissioner Crop Reports). It also is common to harvest bell peppers for fresh market while they are green, before they reach mature colors such as red or yellow. A bell pepper field usually is harvested two to four times. After the bell peppers are packed, they are quickly transported to a storage facility where they are cooled and palletized at scientifically recommended temperatures.

Nearly all bell peppers are harvested by hand and packed into cartons either in the field, from mobile packing platforms, or more commonly at packing facilities. A carton weighs 26 to 28 pounds. For this study we used 28-pound cartons.

Harvesting costs include cartons, picking and packing, loading, and hauling the crop to the nearest cooling facility. Harvesting cost estimates obtained from our interview include a \$0.85 cost for the carton (fresh market bell peppers), \$0.40 per carton for picking and packing fresh market bell peppers, \$0.20 per carton for picking processed bell peppers, and \$0.65 per carton for loading and hauling the crop for fresh market and processing. Selling costs are estimated at \$0.50 and \$0.25 per carton, respectively, for fresh market and processing.

We did not include cooling costs because we did not get sufficient information on actual costs or usage of cooling facilities.

INTEREST ON OPERATING CAPITAL

We calculated interest on operating capital at a nominal rate of 10 percent per year. Interest on operating capital reflects the costs of borrowing money or an opportunity cost for using in-house funds. Interest on operating capital is charged until income is received from the crop at harvest. A nominal interest rate is the current market cost of borrowed funds during the production year.

DISPOSING OF CROP RESIDUE

After harvest, drip tape is removed and the field is disced twice to incorporate all crop residues into the soil.

CASH OVERHEAD COSTS

Land rent. Land rental contracts and charges for agricultural production can range widely by region and also depend on the availability of well water on the property. In Ventura County, if there is a well on the property the landlord often pays for the pump, the permanent parts of the irrigation facilities, and the costs of maintaining the well. The grower generally is responsible for the costs of energy needed to pump the water.

Most of the growers we interviewed rented land with wells that provide a portion of their farms' water requirements. We do not have sufficient data, however, to compare land rent for properties with and without well water. We suggest that growers evaluate the value and costs associated with well water and take this into account when determining an appropriate cost for land rent.

This study assumes an average cash rent of \$1,320 per acre per year (\$110 per acre per month). Using a five-month average growth period from land preparation to harvest, the bell pepper enterprise is charged a rent of \$550 per acre per crop.

Property taxes. Counties charge a base property tax rate of 1 percent on the assessed value of the property, including equipment, buildings, and improvements. Special assessment districts in some counties charge additional taxes on property. For our study we calculated county taxes at 1 percent of the value of the property.

Insurance. Growers also carry insurance for property protection, which is typically calculated at 0.713 percent of the average value of assets. In addition, a farm of the size specified in this report would carry liability insurance of \$1,040 per year to cover accidents on the entire farm.

Supervisors, foremen, and management. Interview information indicated that the size of farm we used in this study would require an average of about three employees who are supervisors or foremen. Wages are estimated at \$110 per acre per year. For the five-month growth period, the bell peppers enterprise is charged \$45 per acre per crop for supervisors and foremen.

Most growers in the survey did not provide management costs, and the wide variations in wages and salaries for professional managers make it difficult to approximate a typical situation. We suggest that, once all production costs have been subtracted from receipts, the residual should be referred to as returns to management.

Office expenses. The office expenses category covers office supplies, telephone service, operating costs for a fax machine, photocopier, and computer, bookkeeping, accounting, legal fees, and so on. Our interview average for office expenses is about \$360 per acre per year. For the five months of bell pepper crop production, office expenses are around \$150 per acre per crop.

NON-CASH OVERHEAD COSTS

We calculated the non-cash overhead or ownership costs of assets (including farm equipment and other investments like an irrigation system, buildings, a fuel tank, and pumps) using the capital recovery method. This method helps growers calculate an annual amount of money to charge the enterprise so that the value of assets will be recovered within a specified period of time at a designated rate of interest. The rate of interest used to calculate ownership cost is 7.40 percent, California's long-term average return rate on agricultural production assets from current income. Because farms use a mix of old and new equipment, we evaluated the value of the equipment complement at 60 percent of new prices.

EQUIPMENT OPERATING CASH COSTS

Equipment operating cash costs for fuel, lubrication, and repairs are calculated using formulas and coefficients developed by the American Society of Agricultural Engineers (ASAE). Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by the ASAE. Fuel and lubrication costs are also determined by ASAE equations based on machinery horsepower (maximum PTO hp) and type of fuel used. Fuel costs are calculated using average (1996 to 1999 period) on-farm delivery prices of \$0.72 per gallon for diesel and \$1.20 per gallon for gasoline. The cost of energy for electric irrigation pumps is \$0.105 per KW.

LABOR

Labor includes owner and hired operator labor with the same wage rate. Hourly labor wages are \$7.50 per hour for machine operators and \$6.25 per hour for other, non-machine workers. These wages are averages based on data from the growers we interviewed. Growers also pay 20 to 34 percent for benefits, which include Workers Compensation, Social Security, Medicare insurance, and other possible benefits. In this study, we assumed an additional 34 percent for benefits, which brings the labor rate to about \$10.00 per hour for machine operators and \$8.40 per hour for other workers.

We calculated 20 percent additional labor time for machinery operation than the time estimated for actual operation. This percentage accounts for the setup, moving, maintenance, and repair of equipment.

PRICES AND YIELDS

Growers did not provide sufficient data on yield or prices, so we used average prices and yields provided by Ventura County Agricultural Commissioner Crop Reports for the 1995 to 1999 period (table A) to estimate gross returns. It should be noted that the county prices and yields for bell peppers are reported for the total crop (fresh and processed combined). According to the county report, about 60 percent of the crop is packed fresh and 40 percent is processed. Also, the county crop reports use free on board (f.o.b.) prices to estimate growers' returns. These prices include harvesting and packing costs, but growers' prices may be different if they incur postharvest costs such as selling and cooling.

Table A. Harvested acreage, average yield, and average prices for bell peppers, Ventura County, 1995–1999

Year	Harvested acreage	Cartons per acre*	Price per carton (\$)
1995	2,298	1,119	5.98
1996	1,914	1,215	5.64
1997	2,273	1,165	6.59
1998	2,250	925	5.10
1999	2,119	946	5.11
Approximate average	2,171	1,075	5.70

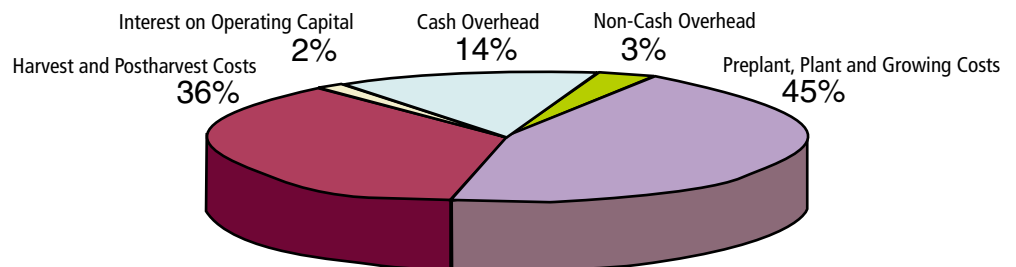
*One carton equals 28 pounds.

SUMMARY OF COSTS

Our sample estimate of the total cost of bell pepper production in Ventura County is \$5,691 per acre (tables 1 and 2). Table 1 presents costs by type of activity and table 2 presents costs by type of input.

The pie graph below shows the breakdown of costs. It consists of about 45 percent for land preparation, planting, and growing costs, 36 percent for harvest and postharvest, 14 percent for cash overhead, 2 percent for interest on operating capital, and 3 percent for non-cash overhead costs. Land preparation, planting, and growing costs include fuel, lube, and machinery repairs, as well as materials and labor for all production practices. Harvesting costs include the cost of the cartons, picking, packing, loading, hauling, and selling. Cash overhead costs include land rent, office expenses, supervisor and foremen wages, property taxes and insurance, and investment repairs.

Figure 1. Proportion of production costs for bell pepper, Ventura County, 1999.



PROFITABILITY ANALYSIS

We analyzed profitability using breakeven costs per carton and gross and economic margins. Breakeven costs allow growers to compare expected market prices with the unit cost of production.

Gross margin (or returns above cash costs) is what growers often refer to as *profit* if there is no debt on the farming operation. It approximates the return to management and investment. If you deduct depreciation, it also approximates taxable income.

Economic profit (or returns above total cost including management) is a very useful measure of how attractive the enterprise is for potential investors and entrants into the business. Economic profit can be positive or zero. A zero economic profit should not be alarming if all costs, including the owners' labor and management costs, are included (and assumed paid) in the production cost. In this study we do not include management charges, so the return after all costs are deducted reflects return to management.

Given the assumptions upon which we based this cost study, the breakeven price for the county average yield of 1,075 cartons per acre is estimated at about \$5.13 per carton to cover all cash costs and \$5.29 per carton to cover total costs ([table 4 part A](#)). On the other hand, the breakeven *yield* for the county average price of \$5.70 per carton is about 968 cartons per acre for cash costs and 998 cartons per acre for total costs. Breakeven price is calculated as the cost of production per acre divided by the yield per acre. Breakeven yield is calculated as cost of production divided by price per carton.

Gross margin for the county average yield and price is estimated at \$613 per acre ([table 4 part C](#)). This is calculated as gross returns (price times yield) less cash costs of production. Returns to management for the county average yield and price are estimated at \$436 per acre ([table 4 part D](#)). This figure is calculated as gross returns minus total (cash and non-cash) costs of production.

Crop yield and prices received by growers, however, vary depending on several factors. Prices for bell peppers in particular vary based on what proportions of the crop are marketed as fresh and processed. Selling and cooling costs also influence prices, depending on whether the costs are incurred by the grower or by the buyer.

We have provided range analyses of price and yield variations on profitability so that each grower can find figures that best match his or her specific situation. The range analyses include breakeven prices at various yield as well as gross margins and returns to management at various yield and price combinations. The gross margin and returns to management ranges are analyzed at increments of \$0.10 per carton for prices and 50 cartons per acre for yield ([table 4, parts A through D](#)).

Table 1. Costs per acre to produce bell peppers, Ventura County, 1999 (labor rates: \$10.00/hr for machine labor, \$8.40/hr for non-machine labor; interest rate: 10.00%)

Operation	Operation time (hrs/ac)	Costs per acre (\$)					Total cost	Your cost (\$)
		Labor cost	Fuel, lube, & repairs	Material cost	Custom/rent			
Preplant:								
Disc 2×	0.38	5	5	0	0	9	_____	
Rip 2×	0.57	7	1	0	0	8	_____	
Plow	0.21	3	3	0	0	6	_____	
Disc 3×	0.57	7	7	0	0	14	_____	
Landplane 3×	0.55	7	6	0	0	13	_____	
Chisel	0.25	3	4	0	0	7	_____	
List & preplant fertilize	0.33	7	4	71	0	82	_____	
Shape beds & roll	0.23	3	2	0	0	5	_____	
TOTAL PREPLANT COSTS	3.09	40	32	71	0	143	_____	
Plant:								
Transplant (plant & labor)	0	0	0	1,093	0	1,093	_____	
TOTAL PLANT COSTS	0	0	0	1,093	0	1,093	_____	
Growing:								
Sprinkler setup (machine & labor)	0.2	15	1	0	0	16	_____	
Irrigate 3×	1.35	11	0	31	0	42	_____	
Fuel/electricity for irrigation pumps (growing)	0	0	0	133	0	133	_____	
Sprinkler removal (machine & labor)	0.2	15	1	0	0	16	_____	
Disease management 2×	0.41	5	4	31	0	39	_____	
Pest management 1×	0	0	0	100	0	100	_____	
Install drip tape	0.5	6	8	186	0	200	_____	
Connect drip system	0.33	3	0	140	0	143	_____	
Irrigate 36×	20	168	0	143	0	311	_____	
Fertilize	0	0	0	213	0	213	_____	
Disease management 2×								
& pest management 2×	0.41	5	4	49	0	57	_____	
Cultivate 2×	0.46	6	5	0	0	10	_____	
Pest management 1×	0.21	2	2	9	0	13	_____	
Pickup truck	1.6	19	8	0	0	27	_____	
TOTAL GROWING COSTS	25.67	255	31	1,036	0	1,321	_____	
Harvest & Sell								
Harvest & sell	0	0	0	2,021	0	2,021	_____	
TOTAL HARVEST & SELL COSTS	0	0	0	2,021	0	2,021	_____	

Continued

Table 1. Costs per acre to produce bell peppers, Ventura County, 1999 (labor rates: \$10.00/hr for machine labor, \$8.40/hr for non-machine labor; interest rate: 10.00%)

Operation	Operation time (hrs/ac)	Costs per acre (\$)					Your cost (\$)
		Labor cost	Fuel, lube, & repairs	Material cost	Custom/ rent	Total cost	
Disposing of Crop Residue:							
Drip tape removal	0.33	29	3	0	0	33	_____
Postharvest disc 2×	0.38	2	5	0	0	9	_____
TOTAL DISPOSING OF CROP RESIDUE COSTS	0.71	34	8	0	0	42	_____
Interest on operating capital @ 10.00%						94	_____
TOTAL OPERATING COSTS/ACRE		329	70	4,221	0	4,714	_____
Cash Overhead:							
Land rent						550	_____
Office expense						150	_____
Liability insurance						0	_____
Supervisors & foreman						45	_____
Property taxes						6	_____
Property insurance						4	_____
Investment repairs						45	_____
TOTAL CASH OVERHEAD COSTS						801	_____
TOTAL CASH COSTS/ACRE						5,515	_____
				Annual cost: capital recovery (\$)		Total cost (\$)	Your cost (\$)
Non-cash Overhead:							
Investment							
Shop building			23	3		3	_____
Shop tools			12	1		1	_____
Fuel tanks & pumps			15	2		2	_____
Irrigation pump			333	46		46	_____
Sprinklers and pipes			549	76		76	_____
Equipment			211	49		49	_____
TOTAL NON-CASH OVERHEAD COSTS			1,142	177		177	_____
TOTAL COSTS/ACRE						5,691	_____

Table 2. Costs and returns per acre to produce bell peppers, Ventura County, 1999 (labor rates: \$10.00/hr for machine labor, \$8.40/hr for non-machine labor; interest rate: 10.00%)

	Quantity per acre	Unit	Price or cost per unit (\$)	Value or cost per acre (\$)	Your cost (\$)
Gross Returns	1,075	carton	5.70	6,128	_____
TOTAL GROSS RETURNS FOR BELL PEPPERS				6,128	_____
Operating Costs:					
Fertilize					
15-15-15 (preplant)	500	pound	0.142	71	_____
N-phuric (growing)	18	gallon	2.16	39	_____
CAN-17 (growing)	70	gallon	1.35	94	_____
15-8-4 (growing)	80	gallon	1.00	80	_____
Plant					
Bell pepper plants	26,000	plant	0.028	728	_____
Custom transplant	1	acre	365.00	365	_____
Water					
Water	25.5	acre-inch	6.83	174	_____
Fuel (pump)					
Booster pump fuel	102	gallon	0.72	73	_____
Electricity (pump)					
Low-pressure pump	571.2	KW	0.105	60	_____
Disease management	1	acre	61.00	61	_____
Pest management	1	acre	127.00	127	_____
Irrigation					
Drip tape (13,200 feet)	1	roll	186.00	186	_____
Hose	209	foot	0.671	140	_____
Harvest & sell					
Cartons	645	carton	0.85	548	_____
Load & haul (all)	1,075	carton	0.65	699	_____
Pick & pack (fresh)	645	carton	0.40	258	_____
Pick (processed)	430	carton	0.20	86	_____
Selling (fresh)	645	carton	0.50	322	_____
Selling (processed)	430	carton	0.25	108	_____
Labor (machine)	9.36	hour	10.00	94	_____
Labor (non-machine)	28	hour	8.40	235	_____
Fuel					
Gasoline	4	gallon	1.20	5	_____
Diesel	42.94	gallon	0.72	31	_____
Lube				5	_____
Machinery repair				29	_____
Interest on operating capital @ 10.00%				94	_____
TOTAL OPERATING COSTS/ACRE				4,714	_____
NET RETURNS ABOVE OPERATING COSTS				1,414	_____

Continued

Table 2. *Continued*

	Quantity per acre	Unit	Price or cost per unit (\$)	Value or cost per acre (\$)	Your cost (\$)
Cash Overhead Costs:					
Land rent				550	_____
Office expense				150	_____
Liability insurance				0	_____
Supervisors & foreman				45	_____
Property taxes				6	_____
Property insurance				4	_____
Investment repairs				45	_____
TOTAL CASH OVERHEAD COSTS/ACRE				801	_____
TOTAL CASH COSTS/ACRE				5,515	_____
Non-cash Overhead Costs (Capital Recovery):					
Shop building				3	_____
Shop tools				1	_____
Fuel tanks & pumps				2	_____
Irrigation pump				46	_____
Sprinklers & pipes				76	_____
Equipment				49	_____
TOTAL NON-CASH OVERHEAD COSTS/ACRE				177	_____
TOTAL COSTS/ACRE				5,691	_____
NET RETURNS ABOVE TOTAL COSTS				436	_____

Table 3. Monthly cash costs per acre to produce bell peppers, Ventura County, 1999

Operation	Costs per acre (\$)					Total
	Month 1	Month 2	Month 3	Month 4	Month 5	
Preplant:						
Disc 2x	9					9
Rip 2x	8					8
Plow	6					6
Disc 3x	14					14
Landplane 3x	13					13
Chisel	7					7
Preplant fertilize	82					82
Shape beds & roll	5					5
TOTAL PREPLANT COSTS	143					143
Plant:						
Transplant (plant & labor)		1,093				1,093
TOTAL PLANT COSTS		1,093				1,093
Growing:						
Sprinkler setup (machine & labor)		16				16
Irrigate 3x (sprinkler)		42				42
Fuel/electricity for irrigation pumps (growing)		51	27	27	27	133
Sprinkler removal (machine & labor)		16				16
Disease management 2x			20		20	39
Pest management 1x		100				100
Install drip tape		200				200
Connect drip system		143				143
Irrigate 36x (drip)		78	78	78	78	311
Fertilize			127	87		213
Disease management 2x & pest management 2x			29	29		57
Cultivate 2x			5	5		10
Pest management 1x				13		13
Pickup truck	5	5	5	5	5	27
TOTAL GROWING COSTS	5	651	291	245	130	1,321
Harvest & sell:						
Harvest & sell					2,021	2,021
TOTAL HARVEST & SELL COSTS					2,021	2,021
Disposing of Crop Residue:						
Drip tape removal					33	33
Postharvest disc 2x					9	9
TOTAL DISPOSING OF CROP RESIDUE COSTS					42	42
Interest on operating capital @ 10.00%	1	16	18	20	38	94
TOTAL OPERATING COSTS/ACRE	149	1,759	309	265	2,231	4,714
Cash Overhead:						
Land rent	110	110	110	110	110	550
Office expense	30	30	30	30	30	150
Liability insurance	0	0	0	0	0	0
Supervisors & foreman	9	9	9	9	9	45
Property taxes	3				3	6
Property insurance	2				2	4
Investment repairs	9	9	9	9	9	45
TOTAL CASH OVERHEAD COSTS	163	158	158	158	163	801
TOTAL CASH COSTS/ACRE	313	1,917	467	423	2,394	5,515

Table 4. Range analyses of bell pepper production costs and returns, Ventura County, 1999

	Costs per acre (\$) for various cartons-per-acre yields						
	925	975	1,025	1,075	1,125	1,175	1,225
Part A. Costs per Acre and per Carton at Varying Yields							
Operating costs/acre:							
Preplant cost	143	143	143	143	143	143	143
Plant cost	1,093	1,093	1,093	1,093	1,093	1,093	1,093
Growing cost	1,321	1,321	1,321	1,321	1,321	1,321	1,321
Harvest & sell cost	1,739	1,833	1,927	2,021	2,115	2,209	2,303
Disposing of crop residue cost	42	42	42	42	42	42	42
Interest on operating capital	92	92	93	94	95	95	96
TOTAL OPERATING COSTS/ACRE	4,429	4,524	4,619	4,714	4,809	4,903	4,998
TOTAL OPERATING COSTS/CARTON	4.79	4.64	4.51	4.38	4.27	4.17	4.08
CASH OVERHEAD COSTS/ACRE	801	801	801	801	801	801	801
TOTAL CASH COSTS/ACRE	5,230	5,325	5,420	5,515	5,609	5,704	5,799
TOTAL CASH COSTS/CARTON	5.65	5.46	5.28	5.12	4.98	4.85	4.73
NON-CASH OVERHEAD COSTS/ACRE	177	177	177	177	177	177	177
TOTAL COSTS/ACRE	5,407	5,502	5,596	5,691	5,786	5,881	5,975
TOTAL COSTS/CARTON	5.85	5.64	5.46	5.29	5.14	5.00	4.88
Part B. Returns per Acre above Operating Costs							
Price (\$/carton):							
5.40	566	741	916	1,091	1,266	1,442	1,617
5.50	658	838	1,019	1,199	1,379	1,559	1,739
5.60	751	936	1,121	1,306	1,491	1,677	1,862
5.70	843	1,033	1,224	1,414	1,604	1,794	1,984
5.80	936	1,131	1,326	1,521	1,716	1,912	2,107
5.90	1,028	1,228	1,429	1,629	1,829	2,029	2,229
6.00	1,121	1,326	1,531	1,736	1,941	2,147	2,352
Part C. Returns per Acre above All Cash Costs (gross margin)							
Price (\$/carton):							
5.40	-235	-60	115	290	466	641	816
5.50	-143	37	218	398	578	758	939
5.60	-50	135	320	505	691	876	1,061
5.70	42	232	423	613	803	993	1,184
5.80	135	330	525	720	916	1,111	1,306
5.90	227	427	628	828	1,028	1,228	1,429
6.00	320	525	730	935	1,141	1,346	1,551
Part D. Returns per Acre above Total Costs (returns to management)							
Price (\$/carton):							
5.40	-412	-237	-61	114	289	464	640
5.50	-319	-139	41	221	402	582	762
5.60	-227	-42	144	329	514	699	885
5.70	-134	56	246	436	627	817	1,007
5.80	-42	153	349	544	739	934	1,130
5.90	51	251	451	651	852	1,052	1,252
6.00	143	348	554	759	964	1,169	1,375

Table 5. Farm equipment and investment values and annual costs based on 2,600 annual farmed acres, Ventura County, 1999

Equipment	Value: 1999 price (\$)	Life (yrs)	Salvage value (\$)	Capital recovery (\$)	Costs			Total annual costs (\$)
					Annual cash overhead (\$)			
					Insurance	Taxes		
120 HP Tractor 4WD (#1)	75,180	6	7,518	14,927	295	413	15,636	
120 HP Tractor 4WD (#2)	75,180	5	7,518	17,236	295	413	17,944	
120 HP Tractor 4WD (#3)	75,180	6	7,518	14,927	295	413	15,636	
200 HP 4WD Tractor	135,500	6	13,550	26,904	531	745	28,181	
45 HP 2WD Tractor	23,030	10	2,303	3,176	90	127	3,393	
Bed shaper	8,900	3	890	3,140	35	49	3,224	
Chisel – 14' (#1)	2,270	3	227	801	9	12	822	
Chisel – 14' (#2)	2,270	3	227	801	9	12	822	
Cultivator – 4-row 40" (#1)	7,130	3	713	2,516	28	39	2,583	
Cultivator – 4-row 40" (#2)	7,130	3	713	2,516	28	39	2,583	
Disc – 21' (#1)	16,510	5	1,651	3,785	65	91	3,941	
Disc – 21' (#2)	16,510	5	1,651	3,785	65	91	3,941	
Disc – 21' (#3)	16,510	5	1,651	3,785	65	91	3,941	
Disc – 21' (#4)	16,510	5	1,651	3,785	65	91	3,941	
Disc – 21' (#5)	16,510	5	1,651	3,785	65	91	3,941	
Disc – 21' (#6)	16,510	5	1,651	3,785	65	91	3,941	
Disc – 21' (#7)	16,510	5	1,651	3,785	65	91	3,941	
Drip tape layer	5,000	15	500	544	20	28	591	
Hydraulic machine	5,000	20	500	475	20	28	522	
Lister (#1)	6,000	4	600	1,653	24	33	1,710	
Lister (#2)	6,000	4	600	1,653	24	33	1,710	
Pickup truck 1/2 ton (#1)	17,160	2	1,716	8,716	67	94	8,878	
Pickup truck 1/2 ton (#2)	17,160	2	1,716	8,716	67	94	8,878	
Pickup truck 1/2 ton (#3)	17,160	2	1,716	8,716	67	94	8,878	
Pickup truck 1/2 ton (#4)	17,160	2	1,716	8,716	67	94	8,878	
Pickup truck 1/2 ton (#5)	17,160	2	1,716	8,716	67	94	8,878	
Plow – 6-bottom	12,000	3	180	4,550	43	61	4,655	
Sprayer 600 gallon (#1)	100,000	5	10,000	22,926	392	550	23,868	
Sprayer 600 gallon (#2)	100,000	5	10,000	22,426	392	550	23,868	
Subsoiler – 12' (#1)	6,490	2	649	3,297	25	36	3,358	
Subsoiler – 12' (#2)	6,490	2	649	3,297	25	36	3,358	
Trailer	2,000	2	200	1,016	8	11	1,035	
Triplane – 14' (#1)	18,230	5	1,823	4,179	71	100	4,351	
Triplane – 14' (#2)	18,230	5	1,823	4,179	71	100	4,351	
Triplane – 14' (#3)	18,230	5	1,823	4,179	71	100	4,351	
TOTAL EQUIPMENT	916,810		90,661	231,895	3,592	5,037	240,524	
60% OF NEW COST*	550,086		54,397	139,137	2,155	3,022	144,314	

Investment	Value: 1999 price (\$)	Life (yrs)	Salvage value (\$)	Capital recovery (\$)	Cost			Total annual costs (\$)
					Annual cash overhead (\$)			
					Insurance	Taxes	Repairs	
Fuel tanks & pumps	38,100	15	3,810	4,142	149	210	1,828	6,329
Irrigation pump	866,666	10	86,667	119,529	3,399	4,767	41,599	169,293
Shop building	60,000	15	6,000	6,524	235	330	2,880	9,969
Shop tools	30,000	15	3,000	3,262	118	165	1,440	4,984
Sprinklers & pipes	1,427,530	10	142,753	196,883	5,598	7,851	68,521	278,853
TOTAL INVESTMENT	2,422,296		242,230	330,340	9,499	13,323	116,268	469,429

Continued

Table 5. *Continued*

Description	Enterprise/ farm size	Unit	Price per unit (\$)	Total cost (\$)
Business Overhead:				
Land rent	2,600	acre	550	1,430,000
Liability insurance	2,600	acre	0.40	1,040
Office expense	2,600	acre	150	390,000
Supervisors & foreman	2,600	acre	45	117,000

*Used to reflect a mix of new and used equipment.

Table 6. Farm equipment actual hours of use and hourly costs based on 2,600 annual farmed acres, Ventura County, 1999

Description	Actual hours of use	Costs per hour (\$)					Total costs per hour
		Capital recovery	Cash overhead		Operating		
			Insurance	Taxes	Repairs	Fuel & lube	
120 HP Tractor 4WD (#1)	2,500	3.58	0.07	0.10	1.89	5.77	11.41
120 HP Tractor 4WD (#2)	3,000	3.45	0.06	0.08	1.91	5.77	11.27
120 HP Tractor 4WD (#3)	2,500	3.58	0.07	0.10	1.89	5.77	11.41
200 HP 4WD Tractor	2,600	6.21	0.12	0.17	3.54	9.61	19.65
45 HP 2WD Tractor	1,200	1.59	0.05	0.06	1.03	1.83	4.55
Bed shaper	670	2.81	0.03	0.04	1.53	0	4.42
Chisel – 14' (#1)	740	0.65	0.01	0.01	0.44	0	1.11
Chisel – 14' (#2)	740	0.65	0.01	0.01	0.44	0	1.11
Cultivator – 4-row 40" (#1)	740	2.04	0.02	0.03	1.39	0	3.49
Cultivator – 4-row 40" (#2)	740	2.04	0.02	0.03	1.39	0	3.49
Disc – 21' (#1)	500	4.54	0.08	0.11	3.65	0	8.38
Disc – 21' (#2)	500	4.54	0.08	0.11	3.65	0	8.38
Disc – 21' (#3)	500	4.54	0.08	0.11	3.65	0	8.38
Disc – 21' (#4)	500	4.54	0.08	0.11	3.65	0	8.38
Disc – 21' (#5)	500	4.54	0.08	0.11	3.65	0	8.38
Disc – 21' (#6)	500	4.54	0.08	0.11	3.65	0	8.38
Disc – 21' (#7)	500	4.54	0.08	0.11	3.65	0	8.38
Drip tape layer	150	2.17	0.08	0.11	1.12	0	3.48
Hydraulic machine	100	2.86	0.12	0.17	1.84	0	4.98
Lister (#1)	500	1.98	0.03	0.04	2.60	0	4.65
Lister (#2)	500	1.98	0.03	0.04	2.60	0	4.65
Pickup truck 1/2 ton (#1)	1,000	5.23	0.04	0.06	1.29	3.45	10.06
Pickup truck 1/2 ton (#2)	1,000	5.23	0.04	0.06	1.29	3.45	10.06
Pickup truck 1/2 ton (#3)	1,000	5.23	0.04	0.06	1.29	3.45	10.06
Pickup truck 1/2 ton (#4)	1,000	5.23	0.04	0.06	1.29	3.45	10.06
Pickup truck 1/2 ton (#5)	1,000	5.23	0.04	0.06	1.29	3.45	10.06
Plow – 6-bottom	610	4.48	0.04	0.06	1.82	0	6.40
Sprayer 600 gallon (#1)	2,000	6.88	0.12	0.17	4.80	3.31	15.27
Sprayer 600 gallon (#2)	2,000	6.88	0.12	0.17	4.80	3.31	15.27
Subsoiler – 12' (#1)	840	2.35	0.02	0.03	1.28	0	3.68
Subsoiler – 12' (#2)	840	2.35	0.02	0.03	1.28	0	3.68
Trailer	1,000	0.61	0.01	0.01	0.35	0	0.97
Triplane – 14' (#1)	540	4.64	0.08	0.11	2.74	0	7.57
Triplane – 14' (#2)	540	4.64	0.08	0.11	2.74	0	7.57
Triplane – 14' (#3)	540	4.64	0.08	0.11	2.74	0	7.57

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