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Loose-leaf Lettuce Production: Sample Costs and Profitability Analysis

Based on 1999 Data Collected from Ventura County, California

UNIVERSITY OF CALIFORNIA
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Etaferahu Takele is Area Farm Advisor, Agricultural Economics and Farm Management, UC Cooperative Extension in Southern California.

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This study presents sample costs of production for fresh market loose-leaf lettuce developed in Ventura County, 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:

UC PEER REVIEWED

Loose-leaf lettuce includes romaine and several other types with similar production and harvesting practices, except in crop (gross) returns that result from differences in prices and yield. We have used weighted average prices and yields to account for these differences.

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 of 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 field 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. Loose-leaf lettuce is grown primarily in the central coast, the southern coast, the Central Valley, and the southern deserts of California. The primary varieties produced in Ventura County are greenleaf, redleaf, romaine, and butterhead. Other varieties produced in the county include endive and escarole. All varieties have similar cultural, harvesting, and marketing requirements.

Seeding rates vary depending on spacing. For this study, we assumed a rate of approximately 160,000 seeds per acre. Seeds are planted two rows to a bed with bed centers 40 inches apart and seeds planted 2 inches apart within the row.

Weed management. Growers interviewed for our study use herbicides at planting to control a wide range of grass and broadleaf weeds. They also weed by hand during thinning.

Fertilization. As mentioned previously, preplant fertilizer of nitrogen (N) and phosphorous is in most cases applied together with listing before the ground is shaped and rolled into beds. Fertilizer applications during the growth period are mostly N and are applied via the furrow irrigation system. The amount and type of fertilizer we included in this study are based on an average of what most growers applied.

Irrigation. During germination, 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 pipes takes 90 minutes of manual labor per acre. Removing pipes takes about the same amount of time.

After seedlings have broken through the soil, growers switch to a furrow irrigation system. Irrigation labor for inspection and maintenance of the system is estimated at about 30 minutes per acre per irrigation for sprinklers, and about 20 minutes per acre per irrigation for furrow 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 21 gallons per acre of diesel and about 350 kilowatts (KW) of electricity per acre would be needed during the production period of loose-leaf lettuce.

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. In a loose-leaf lettuce crop production, irrigation commonly uses about 15 to 18 acre-inches of water.

Pest and disease management. Insects that can affect loose-leaf lettuce production include armyworms, aphids, cutworms, and loopers. Most of these pests can be treated at the larval stage. Growers usually rotate insecticides in order to slow the potential development of pesticide resistance. Written recommendations from State of California-licensed pest control advisors are required for pesticide use. For information and pesticide use permits, contact your local 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.

Depending on the region, a number of diseases may infect loose-leaf lettuce during any phase of growth. The most common diseases affecting loose-leaf lettuce in Ventura County are fungi such as lettuce drop (*Sclerotinia minor* and *S. sclerotiorum*), bottom rot (*Rhizoctonia solani*) and downy mildew (*Bremia lacucae*). This study assumes that some fungicide is used as a preventive measure.

HARVEST AND SELL

Loose-leaf lettuce crop is field packed into cartons. A carton typically contains 24 heads of romaine, weighing about 24 pounds, or 24 heads of other type of loose-leaf lettuce, weighing about 22 pounds. After the lettuce crop is packed, it is quickly transported to a storage facility where it is cooled and palletized at scientifically recommended temperatures.

Harvesting costs in this study include cartons, picking and packing, loading, and hauling the crop to the nearest cooling facility. We estimated a cost of $1.15 for the carton itself, $0.60 per carton for picking and packing, and $0.65 per carton for loading and hauling. Selling costs are estimated at $0.50 per carton.

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, 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 four-month average growth period from land preparation to harvest, the loose-leaf lettuce enterprise is charged a rent of $440 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 four months growth period, the lettuce enterprise is charged $36 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 four months of lettuce crop production, office expenses are estimated at about $120 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, nonmachine 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 non-machine workers.

We calculated 20 percent additional labor time for machinery operation than the time estimated for the 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. Yield and prices vary for romaine lettuce and other types of loose-leaf lettuce. We calculated weighted average prices and yield to give us an overall number for gross return. 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, production, yield, and average prices for fresh market loose leaf lettuce, Ventura County, 1995–1999

Year	Harvested acreage	Production (tons) Romaine leaf lettuce	Other leaf lettuce	Total	Total production (cartons)*	Cartons per acre	Price per carton ($)
1995	5,994	24,077	33,710	57,787	5,070,962	846	6.54
1996	5,500	16,125	32,820	48,945	4,327,386	787	5.37
1997	4,922	21,137	26,382	47,519	4,159,780	845	5.44
1998	4,623	17,608	21,651	39,259	3,435,606	743	5.77
1999	3,810	14,048	24,926	38,974	3,436,667	902	4.13
Approximate average	4,970	18,599	27,898	46,497	4,086,080	825	5.45

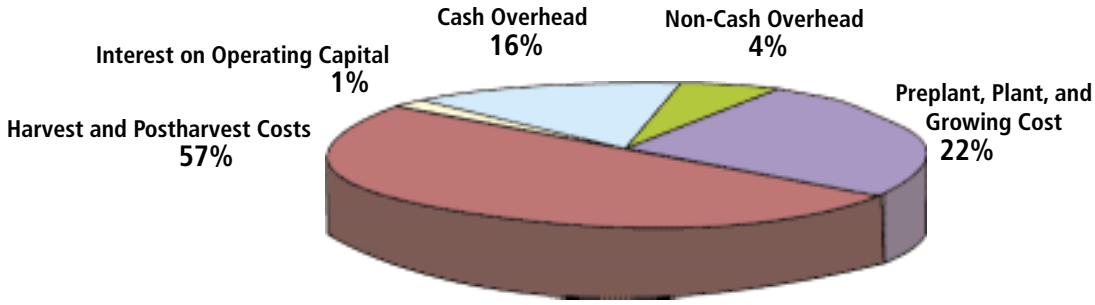
*One carton equals 24 pounds for Romaine and 22 pounds for other types of loose leaf lettuce.

SUMMARY OF COSTS

Our sample estimate of the total cost of loose-leaf lettuce production in Ventura County is $4,193 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 22 percent for land preparation, planting, and growing costs, 57 percent for harvest and postharvest costs, 16 percent for cash overhead, 1 percent for interest on operating capital, and 4 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 in this study include the cost of the carton, picking and packing, loading and hauling to the nearest cooling facility, and selling. Postharvest cost in this study include two discings. Cash overhead costs include land rent, office expenses, liability insurance, supervisor and foreman wages, property taxes, property insurance, and investment repairs.

Figure 1. Proportion of production costs for loose leaf-lettuce, Ventura County, 2000.



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 five-year county average yield of 825 cartons per acre is estimated at about $4.87 per carton to cover all cash costs and $5.08 per carton to cover total costs (table 4 part A). On the other hand, the breakeven *yield* for the county average price of $5.45 per carton is about 738 cartons per acre for cash costs and 769 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 $475 per acre (table 4 part C). This is calculated as gross returns (price times yield) minus cash costs of production. Returns to management for the county average yield and price are estimated at $303 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. Selling and cooling costs, for instance, may 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 yields 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 loose-leaf lettuce, 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	
Preplant:							
Disc 2x	0.38	5	5	0	0	9	
Rip 2x	0.57	7	1	0	0	8	
Plow	0.21	3	3	0	0	6	
Disc 3x	0.57	7	8	0	0	15	
Landplane 3x	0.55	7	6	0	0	13	
Chisel	0.25	3	4	0	0	7	
Listing & pre-plant fertilize	0.33	7	4	53	0	64	
Shape beds & roll	0.23	3	2	0	0	5	
TOTAL PREPLANT COSTS	**3.09**	**40**	**33**	**53**	**0**	**126**	
Plant:							
Plant seed	0.22	3	4	150	0	156	
TOTAL PLANT COSTS	**0.22**	**3**	**4**	**150**	**0**	**156**	
Growing:							
Weed management 1x	0.21	2	2	83	0	88	
Sprinkler setup (machine & labor)	0.20	15	1	0	0	16	
Irrigate 5x (sprinkler)	2.25	19	0	36	0	55	
Fuel/electricity for irrigation pumps (growing)	0	0	0	27	0	27	
Sprinkler removal (machine & labor)	0.20	15	1	0	0	16	
Furrow setup (labor)	0.40	3	0	0	0	3	
Irrigate 5x (furrow)	1.50	13	0	70	0	83	
Electricity for irrigation pump (growing)	0	0	0	24	0	24	
Cultivate 2x	0.46	6	5	0	0	10	
Fertilize	0	0	0	118	0	118	
Pest management 1x	0.21	2	2	9	0	14	
Disease management 1x	0.21	2	2	37	0	41	
Thinning and weeding 1x	0	0	0	75	0	75	
Disease management 1x & pest management 1x	0.21	2	2	46	0	50	
Pickup truck	1.60	19	8	0	0	27	
TOTAL GROWING COSTS	**7.43**	**99**	**21**	**526**	**0**	**646**	
Harvest & Sell							
Harvest & sell	0	0	0	2,393	0	2,393	
TOTAL HARVEST & SELL COSTS	**0**	**0**	**0**	**2,393**	**0**	**2,393**	

Continued

Table 1. *Continued*

Operation	Operation time (hrs/ac)	Costs per acre ($) Labor cost	Fuel, lube, & repairs	Material cost	Custom/ rent	Total cost	Your cost ($)
Disposing of Crop Residue:							
Postharvest disc 2x	0.38	5	5	0	0	9	
TOTAL DISPOSING OF CROP RESIDUE COSTS	**0.38**	**5**	**5**	**0**	**0**	**9**	
Interest on operating capital @ 10.00%						40	
TOTAL OPERATING COSTS/ACRE		146	62	3,121	0	3,370	
Cash Overhead:							
Land rent						440	
Office expense						120	
Liability insurance						0	
Supervisors & foreman						36	
Property taxes						6	
Property insurance						4	
Investment repairs						45	
TOTAL CASH OVERHEAD COSTS						**652**	
TOTAL CASH COSTS/ACRE						**4,021**	

	Costs per producing acre ($)	Annual cost: capital recovery ($)	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	175	44	44	
TOTAL NON-CASH OVERHEAD COSTS	**1,106**	**171**	**171**	
TOTAL COSTS/ACRE			**4,193**	

Table 2. Costs and returns per acre to produce loose-leaf lettuce, 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	**825**	**carton**	**5.45**	**4,496**	_____
TOTAL GROSS RETURNS FOR LETTUCE				**4,496**	_____
Operating Costs:					
Fertilize:					
16-20-0 (preplant)	320.00	pound	0.165	53	_____
AN 20 (growing)	60.00	gallon	1.05	63	_____
15-8-4 (growing)	35.00	gallon	1.00	35	_____
CAN-17 (growing)	15.00	gallon	1.35	20	_____
Seed:					
Lettuce seed	13.00	pound	11.55	150	_____
Weed management	1.00	acre	83.00	83	_____
Water:					
Water	15.53	acre-inch	6.83	106	_____
Fuel (pump);					
Booster pump fuel	21.00	gallon	0.72	15	_____
Electricity (pump)					
Low-pressure pump	347.88	KW	0.105	37	_____
Pest management	1.00	acre	18.00	18	_____
Disease management	1.00	acre	73.00	73	_____
Thin & weed:					
Contract	1.00	acre	75.00	75	_____
Harvest & sell:					
Cartons	825.00	carton	1.15	949	_____
Pick & pack	825.00	carton	0.60	495	_____
Load & haul	825.00	carton	0.65	536	_____
Selling	825.00	carton	0.50	413	_____
Labor (machine)	8.37	hour	10.00	84	_____
Labor (non-machine)	7.47	hour	8.40	63	_____
Fuel					
Gasoline	3.99	gallon	1.20	5	_____
Diesel	36.90	gallon	0.72	27	_____
Lube				5	_____
Machinery repair				26	_____
Interest on operating capital @ 10.00%				40	_____
TOTAL OPERATING COSTS/ACRE				**3,370**	_____
NET RETURNS ABOVE OPERATING COSTS				**1,126**	_____

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				440	_____
Office expense				120	_____
Liability insurance				0	_____
Supervisors & foreman				36	_____
Property taxes				6	_____
Property insurance				4	_____
Investment repairs				45	_____
TOTAL CASH OVERHEAD COSTS/ACRE				**652**	_____
TOTAL CASH COSTS/ACRE				**4,021**	_____
Non-cash Overhead Costs (Capital Recovery):					
Shop building				3	_____
Shop tools				1	_____
Fuel tanks & pumps				2	_____
Irrigation pump				46	_____
Sprinklers & pipes				76	_____
Equipment				44	_____
TOTAL NON-CASH OVERHEAD COSTS/ACRE				**171**	_____
TOTAL COSTS/ACRE				**4,193**	_____
NET RETURNS ABOVE TOTAL COSTS				**303**	_____

Table 3. Monthly cash costs per acre to produce loose-leaf lettuce, Ventura County, 1999

	Costs per acre ($)				
Operation	**Month 1**	**Month 2**	**Month 3**	**Month 4**	**Total**
Preplant:					
Disc 2x	9				9
Rip 2x	8				8
Plow	6				6
Disc 3x	15				15
Landplane 3x	13				13
Chisel	7				7
Listing & preplant fertilize	64				64
Shape beds & roll	5				5
TOTAL PREPLANT COSTS	**126**				**126**
Plant:					
Plant seed		156			156
TOTAL PLANT COSTS		**156**			**156**
Growing:					
Weed management 1x		88			88
Sprinkler setup (machine & labor)		16			16
Irrigate 5x (sprinkler)		55			55
Fuel/electricity for irrigation pumps (growing)		27			27
Sprinkler removal (machine & labor)		16			16
Furrow setup (labor)		3			3
Irrigate 5x (furrow)		9	37	37	83
Electricity for irrigation pumps (growing)		2	11	11	24
Cultivate 2x		5	5		10
Fertilize			118		118
Pest management 1x		13			13
Disease management 2x			41		41
Thinning & weeding			75		75
Disease management 1x & pest management 1x				50	50
Pickup truck	7	7	7	7	27
TOTAL GROWING COSTS	**7**	**241**	**294**	**104**	**646**
Harvest & Sell:					
Harvest & sell				2,393	2,393
TOTAL HARVEST & SELL COSTS				**2,393**	**2,393**
Disposing of Crop Residue:					
Postharvest disc 2x				9	9
TOTAL DISPOSING OF CROP RESIDUE COSTS				**9**	**9**

Continued

Table 3. *Continued*

Operation	Costs per acre ($) Month 1	Month 2	Month 3	Month 4	Total
Interest on operating capital @ 10.00%	1	4	7	28	40
TOTAL OPERATING COSTS/ACRE	**134**	**402**	**300**	**2,534**	**3,370**
Cash Overhead:					
Land rent	110	110	110	110	440
Office expense	30	30	30	30	120
Liability insurance	0	0	0	0	0
Supervisors & foreman	9	9	9	9	36
Property taxes	3			3	6
Property insurance	2			2	4
Investment repairs	11	11	11	11	45
TOTAL CASH OVERHEAD COSTS	**166**	**160**	**160**	**166**	**652**
TOTAL CASH COSTS/ACRE	**299**	**562**	**460**	**2,700**	**4,021**

Table 4. Range analyses of loose-leaf lettuce production costs and returns, Ventura County, 1999

	Costs per acre ($) for various cartons-per-acre yields						
	675	**725**	**775**	**825**	**875**	**925**	**975**
Part A. Costs per Acre and per Carton at Varying Yields							
Operating costs/acre:							
Preplant cost	126	126	126	126	126	126	126
Plant cost	156	156	156	156	156	156	156
Growing cost	646	646	646	646	646	646	646
Harvest & sell cost	1,958	2,103	2,248	2,393	2,537	2,682	2,827
Disposing of crop residue cost	9	9	9	9	9	9	9
Interest on operating capital	37	38	39	40	41	43	44
TOTAL OPERATING COSTS/ACRE	**2,931**	**3,077**	**3,224**	**3,370**	**3,516**	**3,662**	**3,809**
TOTAL OPERATING COSTS/CARTON	**4.34**	**4.24**	**4.16**	**4.08**	**4.02**	**3.96**	**3.91**
CASH OVERHEAD COSTS/ACRE	**652**	**652**	**652**	**652**	**652**	**652**	**652**
TOTAL CASH COSTS/ACRE	**3,583**	**3,729**	**3,875**	**4,021**	**4,168**	**4,314**	**4,460**
TOTAL CASH COSTS/CARTON	**5.31**	**5.14**	**5.00**	**4.87**	**4.76**	**4.66**	**4.57**
NON-CASH OPERATING COSTS/ACRE	**171**	**171**	**171**	**171**	**171**	**171**	**171**
TOTAL COSTS/ACRE	**3,754**	**3,900**	**4,047**	**4,193**	**4,339**	**4,485**	**4,631**
TOTAL COSTS/CARTON	**5.56**	**5.38**	**5.22**	**5.08**	**4.96**	**4.85**	**4.75**
Part B. Returns per Acre above Operating Costs							
Price ($/carton):							
$5.15	545	656	768	879	990	1,101	1,213
$5.25	612	729	845	961	1,078	1,194	1,310
$5.35	680	801	923	1,044	1,165	1,286	1,408
$5.45	747	874	1,000	1,126	1,253	1,379	1,505
$5.55	815	946	1,078	1,209	1,340	1,471	1,603
$5.65	882	1,019	1,155	1,291	1,428	1,564	1,700
$5.75	950	1,091	1,233	1,374	1,515	1,656	1,798
Part C. Returns per Acre above All Cash Costs (gross margin)							
Price ($/carton):							
$5.15	–107	5	116	227	339	450	561
$5.25	–39	77	194	310	426	542	659
$5.35	28	150	271	392	514	635	756
$5.45	96	222	349	475	601	727	854
$5.55	163	295	426	557	689	820	951
$5.65	231	367	504	640	776	912	1,049
$5.75	298	440	581	722	864	1,005	1,146
Part D. Returns per Acre above Total Costs (returns to management)							
Price ($/carton):							
$5.15	–278	–167	–55	56	167	278	390
$5.25	–210	–94	22	138	255	371	487
$5.35	–143	–22	100	221	342	463	585
$5.45	–75	51	177	303	430	556	682
$5.55	–8	123	255	386	517	648	780
$5.65	60	196	332	468	605	741	877
$5.75	127	268	410	551	692	833	975

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

Equipment	Value: 1999 price ($)	Life (yrs)	Salvage value ($)	Costs			
				Capital recovery ($)	Annual cash overhead ($)		Total annual costs ($)
					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
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
Planter – 6-row	8,900	5	890	2,040	35	49	2,124
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	22,926	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	**915,710**		**90,551**	**232,916**	**3,587**	**5,031**	**241,535**
60% OF NEW COST*	**549,426**		**54,331**	**139,750**	**2,152**	**3,019**	**144,921**

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

Continued

Table 5. *Continued*

Investment	Value: 1999 price ($)	Life (yrs)	Salvage value ($)	Costs				
				Capital recovery ($)	Annual cash overhead ($)			Total annual costs ($)
					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**

Business Overhead	Enterprise/ farm size	Unit	Price per unit ($)	Total cost ($)
Land rent	2,600	acre	440	1,144,000
Liability insurance	2,600	acre	0.4	1,040
Office expense	2,600	acre	120	312,000
Supervisors & foreman	2,600	acre	36	93,600

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 ($)					
		Capital recovery	Cash overhead		Operating		Total costs per hour
			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
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
Planter – 6-row	500	2.45	0.04	0.06	1.97	0	4.52
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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