
UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2009

SAMPLE COSTS TO PRODUCE
ORGANIC
LEAF LETTUCE



Double-Cropped
CENTRAL COAST REGION
Santa Cruz & Monterey Counties

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CONTENTS

INTRODUCTION	2
ASSUMPTIONS	3
Production Operating Costs	3
Labor, Interest and Equipment	5
Cash Overhead	6
Non-Cash Overhead.....	7
Acknowledgements.....	8
REFERENCES.....	9
Table 1. Cost Per Acre to Produce Organic Leaf Lettuce.....	10
Table 2. Costs and Returns Per Acre to Produce Organic Leaf Lettuce.....	12
Table 3. Monthly Cash Costs Per Acre to Produce Organic Lettuce	14
Table 4. Ranging Analysis.....	16
Table 5. Whole Farm Annual Equipment, Investment, and Business Overhead Costs	17
Table 6. Hourly Equipment Costs	18
Table 7. Operations with Equipment.....	19

INTRODUCTION

Organic production, as defined by the USDA’s Organic Foods Production Act of 1990, as amended (7 U.S.C. 6501 et seq.), is ‘a production system that is managed in accordance with the Act and associated regulations to respond to site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity’.

The sample costs to produce organic leaf lettuce in the Central Coast Region – Santa Cruz and Monterey 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, but will not apply to every situation. Sample costs for labor, materials, equipment and custom services are based on current figures. A “*Your Costs*” column in Tables 1 and 2 is provided for you to enter your farm costs.

The hypothetical farm operation, production practices, overhead, and calculations are described under the assumptions. For additional information or explanation of calculations used in the study call the Department of Agricultural and Resource Economics, University of California, Davis, California, (530) 752-3589 or the Santa Cruz County UC Cooperative Extension office, (831) 763-8040.

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) 752-1517 or from local county UC Cooperative Extension offices.

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ASSUMPTIONS

The following assumptions refer to tables 1 to 7 and pertain to sample costs to produce organic leaf lettuce in the Central Coast Region – Santa Cruz and Monterey Counties. Cultural practices and costs for organic lettuce production vary considerably among growers within the region; therefore, many of the costs, practices, and materials in this study will not be applicable to every farm. The practices and inputs used in this cost study serve as a guide only. **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 hypothetical farm is based on a 200 non-contiguous acre vegetable crop operation on which five acres are planted to organically grown fresh market leaf lettuce. Other crops grown are conventional and organic broccoli, cauliflower, and celery. The farm has met all requirements for organic production. The farm can produce up to 2 to 2.5 vegetable crops per year on each field. However in organic systems, when cover crops are planted, the number of vegetable or cash crops is often reduced to 1.5 to 2.0 crops per year per field. For this study, two crops per field per year (double-cropped) are assumed. Costs that affect both crops are allocated accordingly. The farm is operated by the grower and includes rented land on which the organic lettuce is planted. Organic farmers generally use a ‘systems management’ approach to farming by including a suite of production practices such as crop rotation, diversification, cover crops and organic matter additions to help build soil fertility and manage pests. Also, growers are continually experimenting with new techniques—especially in fertilization and pest management—as new strategies and technologies become available.

Production Operating Costs

Land Preparation. Primary tillage, which includes discing, rolling, subsoiling, and land leveling, occurs in October and November of the year preceding planting. Fields are subsoiled, disced and rolled two times, then chiseled twice, followed by two passes with a landplane (these costs are allocated equally to the two crops). The land is disced and rolled in August following the first crop. In August, a custom operator lists the 40-inch beds and incorporates the preplant fertilizer. Two passes are made with a rolling cultivator; then in one operation, the grower shapes and rolls the bed.

Cover Crop. A cereal/legume mix cover crop is planted every second season (alternate years) at 120 pounds per acre following basic land preparation. However, practices vary widely among organic growers. For example, alternative cover crops that are used include cereal cover crops and mustards. In addition the frequency of their use can vary between growers (i.e. every year versus every other year). The crop is mowed in March of the first year and incorporated into the soil with two discing passes. One-half of the cost is allocated to the field each year with one-quarter of the cost charged to each crop (4 crops over a 2 year period).

Plant/Stand Establishment. An organically grown leaf lettuce variety is direct seeded using a four-bed precision planter, planting two-rows (lines) on 40-inch beds. Fields are planted to a stand of 156,000 plants per acre at two to three-inch plant spacing. Alyssum for insectary purposes is planted on 5% of the acres, thus reducing the actual lettuce population to 148,200 plants per acre over the five acres. In the Central Coast leaf lettuce is planted from late December to mid-August. In this study the lettuce is planted in August following an organic broccoli crop. The plants are hand thinned approximately 30 days after planting.

Fertilize/Soil Amendments. Five tons of compost and one ton of gypsum (two and one-half tons of compost and one-half ton of gypsum are allocated to each crop) are commercially broadcast over the field prior to the primary tillage operations. The gypsum and compost are blended and applied in a single operation.

Pelleted chicken manure (4-4-2) at 1,000 pounds per acre (40 pounds N) is applied at listing. Blood meal (13-0-0) is sidedressed by the grower at 450 pounds (58.5 pounds N) per acre approximately 30 to 35 days after planting (September). Phytamin 801, an organic liquid fertilizer, is applied through the drip system at six-gallons or 57 pounds per acre three times (September 1X; October 2X), totaling 18 gallons or 171 pounds (10.26 lbs N) per acre. It is assumed that soil building practices including incorporation of cover crops and applications of compost increase soil organic matter levels to mineralize sufficient N for the remainder of the crop needs.

Irrigation. The water is pumped from wells. Based on current grower and district information, the estimated cost is \$100.00 per acre-foot or \$8.33 per acre-inch. Water costs vary considerably depending upon water district and pumping variables. In some areas district or agency fees may apply. A pre-irrigation using two acre-inches is applied prior to seedbed preparation to soften the soil. Approximately three-acre inches of water are applied through sprinklers during stand establishment – two-inches during the first 6-10 days after planting and another inch 2-3 weeks later prior to thinning. An additional 12.00 acre-inches are applied through the drip system during the remainder of the growing season for a seasonal total of 15.00 acre-inches. Total water applied including the pre-irrigation is 17.00 acre-inches. Water use will vary depending on various factors such as irrigation method, soil type, weather, and the time of the year the crop is planted.

Drip Tape. The grower lays the drip tape down the center of the bed by hand after thinning. Prior to harvest the tape is picked up and hydraulically rolled onto spindles. Each operation is assumed to require an equipment operator and 3 men to handle the tape. The tape is assumed to last one year and used on two crops. One half of the drip tape is allocated to each crop.

Pest Management. Pest control materials and rates mentioned in this cost study are listed in *Integrated Pest Management for Cole Crops and Lettuce* and *UC Pest Management Guidelines: Lettuce*. For more information on pesticides available, pest identification, monitoring, and management visit the UC IPM website at www.ipm.ucdavis.edu. 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.

Pest Control Adviser. A Pest Control Adviser (PCA) or Consultant monitors the field for insects, diseases, beneficial insects, and agronomic problems to determine if control measures are necessary. The Pest Management Consultant fee in this study is \$30 per acre.

Weeds. The crop is thinned and weeded 30 to 35 days post plant (September). The field is cultivated after thinning, and two weeks later, it is cultivated and furrowed (break bottoms). The fields are handweeded approximately three weeks after thinning (October), then cultivated and furrowed (break bottoms).

Insects. Lettuce aphid is managed with the use of insectary plantings in this study. The main beneficial is the syrphid fly. One bed with two rows (lines) every 20 beds (5% of the acres) in the field are planted in August to alyssum using a planter junior. Seeding rate per acre is two to three million seed or approximately one pound. In this study 0.05 pounds per acre are planted over the five acres. The percentage of acreage planted will depend on the history of the field and pest pressure, but can range from 0 to 9%. Also the land cost or rent will influence the amount planted to insectaries – lower cost ground, more planting; higher cost ground, lesser planting. A *Bacillus thuringiensis* pesticide (Dipel) for worm control is applied in September. Also during the same application, a Pyrethrum based insecticide (Pyganic) is applied for worm and aphid control.

Disease. Downey mildew can cause damage and crop loss in organic lettuce production. Organically acceptable copper products are a possible means of disease management; however, the application will not provide control under severe pressure, but may provide limited control under low to moderate pressure. Resistant varieties are the best control strategy for downy mildew in lettuce. No fungicides are applied in this study.

Harvest. Organic leaf lettuce is hand harvested (field-packed) under contract 70 to 80 days after planting. Cool season plantings may require 130 days to mature but as the season warms, time to maturity decreases. Total costs will vary by type of pack, labor (piece rate vs. hourly), packer and other miscellaneous items. The costs in this study are \$2.00 for the box (carton), \$2.15 per box for harvest labor, which brings the field harvest cost to \$4.15 per packed box, 24 heads per box weighing 20 to 26 pounds (25 lbs in this study) per box. Transportation costs vary depending on the distance to market and are included in the above costs. Most growers are within a 25-mile radius of the cooler. Cooling and palletizing cost an additional \$1.10 per box, which brings the total harvest cost to \$5.25 per box. Selling costs are 8% of the market price and \$1.20 per box is used.

Yields. The crop yield is 750 twenty-five pound boxes or 9.38 tons per acre, which takes into account the 5% acreage dedicated to the insectary planting. The typical yield range in the area is 500 to 1,000 boxes per acre. Like conventionally produced crops, yields for organically produced crops can vary depending on site and growing conditions. In some situations, and in years with high pest populations, organic yields may be lower than conventional yields because of fewer treatment options. Conversely, when growing conditions are optimal, and pest pressure low, organic yields can be similar or the same as conventional yields.

Returns. The price for Central Coast fresh market organic leaf lettuce delivered and sold through grower-shipper channels is assumed for this study to be \$15.00 per 25-pound box. This information is derived by using 70% of the average 2006 - 2008 San Francisco Terminal Market California origination selling prices. Table 4 shows the net returns above operating costs, cash costs and total costs for a range of prices and yields.

Pickup. The grower uses the pickup for business and personal use. The assumed business use is 2,856 miles per year for the farm.

Labor, Interest and Equipment

Labor. Labor rates of \$17.55 per hour for machine operators and \$13.50 for general labor includes payroll overhead of 35%. The basic hourly wages are \$13.00 for machine operators and \$10.00 for general labor. The overhead includes the employers' share of federal and California state payroll taxes, workers' compensation insurance for truck crops (code 0172), and a percentage for other possible benefits. Workers' compensation insurance costs will vary among growers, but for this study the cost is based upon the average industry final rate as of January 1, 2008 (California Department of Insurance, March 18, 2008, unreferenced). 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.

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 5.75% 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.

Equipment Operating Costs. Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by American Society of Agricultural 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 red dye diesel and gasoline are \$3.70 (excludes excise taxes) and \$3.56 per gallon, respectively. The cost includes a 2% local sales tax on diesel fuel, but does not include excise taxes. Gasoline costs include an 8% sales tax plus federal and state excise tax. Some federal and excise tax can be refunded for on-farm use when filing your income tax. The costs are based on 2008 (July to December) American Automobile Association (AAA) and Department of Energy (DOE) monthly data. The fuel, lube, and repair cost per acre for each operation in Table 1 is determined by multiplying the total hourly operating cost in Table 6 for each piece of equipment used for the selected operation by the hours per acre. Tractor time is 10% higher than implement time for a given operation to account for setup, travel and down time.

Risk. Risks associated with organic lettuce production are not assigned a production cost. 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 fresh market vegetable production. The market for fresh vegetables is volatile for both price and quantity. A market channel should be determined before any lettuce production begins.

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. Because overhead costs are farm and ranch specific, costs will vary among growers. **Costs are split in most cases equally between the double cropped acreage.**

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 two 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 0.82% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$861 for the entire farm or \$4.31 per acre.

Office Expense. Annual office and business expenses are estimated at \$250 per acre. Being two crops are grown on the same acres; \$125 is allocated to each crop. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, road maintenance, etc.

Rent. Land rents for Monterey and Santa Cruz Counties ranges from \$900 to \$2,500 per acre. In this study, land rented for lettuce and broccoli production is \$2,200 per acre with \$1,200 allocated to lettuce and \$1,000 to broccoli. Rents vary by area and ground quality. The land rented includes developed wells and irrigation system. The landowner incurs all costs for the land and the irrigation system.

Organic Certification. The grower pays an annual fee based on total organic farm income as well as a crop and organic system plan inspection fee. The crop inspection fee varies based on inspector's hourly rate, travel time and associated travel expenses. For this study, the cost of \$900 is based on the double cropped organic lettuce and organic broccoli each grown on the five acres. A cost of \$90 per acre is charged to each crop.

Food Safety Program. Many growers of fresh market commodities such as leafy greens incorporate and participate in food safety programs for their operations. Part of a food safety program is participation in third party (independent) audits that are done to ensure the safety of fresh products and accommodate buyer requests, and to enhance marketability of the crop. Costs will vary depending upon farm or inspection circumstances. For this study, costs for the farm are estimated at approximately \$1,000 per year.

Supervisor Salaries. Wages for managers are not included as a cash cost. Any returns above total costs are considered a return to management.

Field Sanitation. Sanitation services provide portable toilets and washbasins to the farm. The cost includes a single toilet with washbasins, deliver and pickup, and two months of weekly servicing. Costs also include soap or other suitable cleansing agent, and single use towels. Separate potable water and single-use drinking cups are also supplied. Growers using contract labor may not have a separate sanitation cost. The contractor supplies the sanitation facilities.

Investment Repairs. Repair costs are the annual maintenance costs for investments in non-cash overhead. For this study annual repairs are calculated as 2% of the new cost.

Non-Cash Overhead

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

Capital Recovery Costs. Capital recovery cost is the annual depreciation and interest costs for a capital investment. It is the amount of money required each year to recover the difference between the purchase price and salvage value (unrecovered capital). Put another way, 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. The calculation for the annual capital recovery costs is $((\text{Purchase Price} - \text{Salvage Value}) \times \text{Capital Recovery Factor}) + (\text{Salvage Value} \times \text{Interest Rate})$.

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery (tractors and implements) the remaining value is a percentage of the new cost of the investment (Boehlje and Eidman). The percent remaining value is calculated from equations developed by the American Society of Agricultural Engineers (ASAE) based on equipment type and years of life. The life in years is estimated by dividing the wearout 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 for land is equal to the purchase price 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 4.25% used to calculate capital recovery cost is the effective long term interest rate effective January 8, 2009. The interest rate is provided by a local farm lending agency and will vary according to risk and amount of loan.

New Grower Organic Certification Information (One time expense, costs not included). Organic growers are required to be registered with the state of California and certified by a federal government approved agency, for which they incur various costs. The total costs vary by the grower's gross organic income, inspection time, and other possible fees. Estimated costs for the state and certifying agencies first year's application and inspection fee is \$700 or \$140 per acre (5 acres) split equally between the two crops.

Building. The metal building or buildings are on a cement slab and comprise 2,400 square feet.

Tools. This includes shop and field tools used on the farm. The value is estimated and does not represent any specific data.

Fuel Tanks. Two 300-gallon fuel tanks using gravity feed are on metal stands. The tanks are setup in a cement containment pad that meets federal, state, and county regulations.

Irrigation/Pipe/Trailers. The irrigation system is maintained by the landowner and included in the land rental cost. The grower owns 1,456 feet of sprinkler pipe. The grower also owns two pipe trailers for hauling the pipe to the field. Irrigation water is pumped from a well and delivered to the fields through an underground pipe system. Main lines above ground are connected to the underground system to deliver water for the sprinkler and drip irrigations. In this study, water is pumped from a depth of 120 feet in a 500-foot well and the grower pays the pumping cost.

Equipment. Farm equipment is purchased new or used, but the study shows the current purchase price for new equipment. The new purchase price is adjusted to 60% to indicate a mix of new and used equipment. Annual ownership costs for equipment and other investments are shown in Table 5. 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.

Acknowledgements. The authors wish to thank the growers, pest control advisers, processors, agricultural product dealers, and researchers who provided input.

Table Values. Due to rounding, the totals may be slightly different from the sum of the components. Some growers prefer to separate Harvest Costs from Total Cash Costs to reflect Total Growing Costs. In the tables in this study: Total Cash Costs - Harvest Costs = Total Growing Costs.

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Table 1. COST PER ACRE TO PRODUCE ORGANIC LEAF LETTUCE
 CENTRAL COAST 2009

Operation	Cash and Labor Costs per Acre						Your Cost
	Operation Time (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/Rent	Total Cost	
Cultural:							
Fertilize: Gypsum/Compost (1/2 cost to lettuce)	0.00	0	0	121	30	151	
Land Prep: Sub Soil, (1/2 cost to lettuce)	0.61	13	51	0	0	64	
Land Prep: Disc & Roll 2X (1/2 cost to lettuce)	0.29	6	25	0	0	31	
Land Prep: Chisel 2X (1/2 cost to lettuce)	0.35	7	29	0	0	37	
Land Prep: Land plane field 2X (1/2 cost to lettuce)	0.24	5	21	0	0	26	
Cover Crop: Plant 1X/2Yr (1/4 cost to lettuce)	0.04	1	2	36	0	39	
Cover Crop: Mow 1X/2Yr (1/4 cost to lettuce)	0.04	1	2	0	0	3	
Cover Crop: Disc 2X/2Yr (1/4 cost to lettuce)	0.07	2	6	0	0	8	
Land Prep: Disc & Roll 1X	0.14	3	13	0	0	16	
Land Prep: List Beds/Fertilize: (Pelleted Chicken Manure)	0.00	0	0	250	25	275	
Irrigate: Preirrigate - Sprinkle	2.00	27	0	17	0	44	
Weed: Cultivate 2X (Rolling Cultivator)	0.21	5	9	0	0	14	
Land Prep: Shape beds & roll	0.23	5	10	0	0	15	
Plant: Lettuce	0.28	9	13	148	0	169	
Insect: Plant Insectory (Alyssum Seed)	0.07	1	2	1	0	4	
Irrigate: Sprinkle 3X	3.00	41	0	25	0	65	
Stand Establishment: Thin. Weed: Hand Hoe	16.25	219	0	0	0	219	
Weed: Cultivate	0.11	2	4	0	0	7	
Irrigate: Lay drip line and laterals (drip tape)	1.00	63	43	196	0	301	
Fertilize: Sidedress 1X (Bloodmeal)	0.20	4	5	338	0	347	
Irrigate: Drip 5X	0.75	10	0	100	0	110	
Fertilize: through drip (Phytamin)	0.00	0	0	87	0	87	
Pest: Worms (Dipel)/Aphid (Pyganic)	0.00	0	0	66	25	91	
Weed: Cultivate/Furrow 2X (Break Bottoms)	0.21	5	9	0	0	13	
Weed: Hand Hoe	12.00	162	0	0	0	162	
Irrigate: Retrieve Drip and Laterals	1.50	113	62	0	0	175	
Pest: Pest Management Consultant	0.00	0	0	0	30	30	
Pickup use	1.43	30	26	0	0	56	
TOTAL CULTURAL COSTS	41.02	732	331	1,384	110	2,557	
Harvest:							
Cut, Pack, Haul	0.00	0	0	0	3,113	3,113	
Cool, Palletize, Sell	0.00	0	0	0	1,725	1,725	
TOTAL HARVEST COSTS	0.00	0	0	0	4,838	4,838	
Postharvest:							
Chop stubble	0	3	7	0	0	11	
TOTAL POSTHARVEST COSTS	0	3	7	0	0	11	
Interest on operating capital @ 5.75%						80	
TOTAL OPERATING COSTS/ACRE		735	338	1,384	4,948	7,485	
CASH OVERHEAD:							
Land Rent						1,200	
Office Expense						127	
Field Sanitation						63	
Liability Insurance						2	
Annual Organic Certification Fees						90	
Property Taxes						7	
Property Insurance						6	
Investment Repairs						12	
TOTAL CASH OVERHEAD COSTS						1,509	
TOTAL CASH COSTS/ACRE						8,994	

UC COOPERATIVE EXTENSION
Table 1. CONTINUED
 CENTRAL COAST 2009

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per Acre				Total Cost	Your Cost
		Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent		
NON-CASH OVERHEAD (Capital Recovery)	Per Producing Acre			Annual Cost Capital Recovery			
Building	400			25	25		
Shop Tools	75			6	6		
Fuel Tanks	23			1	1		
Pipe Sprinkler	66			8	8		
Trailer - Pipe #1	11			2	2		
Trailer - Pipe #2	11			2	2		
Equipment	695			74	74		
TOTAL NON-CASH OVERHEAD COSTS	1,280			117	117		
TOTAL COSTS/ACRE						9,112	

See text page 8, Table Values. Some growers prefer to separate harvest costs from total cash costs to reflect total growing costs. In this and following Tables: Total Cash Costs – Harvest Costs = Total Growing Costs. (\$8,994 - \$4,838 = \$4,156)
 Land Prep costs done prior to first planting that affected the lettuce and second crop on same land are split equally between the lettuce and second crop.

UC COOPERATIVE EXTENSION
Table 2. COSTS AND RETURNS PER ACRE TO PRODUCE ORGANIC LEAF LETTUCE
 CENTRAL COAST 2009

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Organic Leaf Lettuce	750.00	box	15.00	11,250	
OPERATING COSTS					
Fertilizer:					
Compost - Green Waste 1/2 cost (tonnage) to lettuce	2.50	ton	40.00	100	
Gypsum 1/2 cost (tonnage) to lettuce	0.50	ton	42.00	21	
Pelleted Chicken Manure	1,000.00	lb	0.25	250	
13-0-0 Bloodmeal	450.00	lb	0.75	338	
6-1-1 Phytamin 801	171.00	lb	0.51	87	
Seed:					
Cover Crop (cereal/legume mix) 1/4 of seed to lettuce	30.00	lb	1.20	36	
Leaf Lettuce (organic)	148.20	thou	1.00	148	
Alyssum	0.05	lb	15.00	1	
Irrigation:					
Water-Pumped	17.00	acin	8.33	142	
Drip Tape (10mil) 1/2 cost (footage) to lettuce	6,541.00	foot	0.03	196	
Insecticide:					
Dipel DF	1.00	lb	15.99	16	
Pyganic 1.4 EC	2.00	pint	24.87	50	
Contract/Custom:					
Ground Application (Insects)	1.00	acre	25.00	25	
Harvest (carton, pick, haul, supervision)	750.00	box	4.15	3,113	
Harvest (palletize, cool)	750.00	box	1.10	825	
Sell Commission 8% of \$15	750.00	box	1.20	900	
Pest Management Consultant	1.00	acre	30.00	30	
Spread Green Waste+Gypsum mixture	3.00	ton	10.00	30	
List & Fertilize	1.00	acre	25.00	25	
Labor (machine)	8.61	hrs	17.55	151	
Labor (non-machine)	43.28	hrs	13.50	584	
Fuel - Gas	5.95	gal	3.36	20	
Fuel - Diesel	63.06	gal	3.70	233	
Lube				38	
Machinery repair				47	
Interest on operating capital @ 5.75%				80	
TOTAL OPERATING COSTS/ACRE				7,485	
NET RETURNS ABOVE OPERATING COSTS				3,765	
CASH OVERHEAD COSTS:					
Land Rent				1,200	
Office Expense				127	
Field Sanitation				63	
Liability Insurance				2	
Annual Organic Certification Fees				90	
Property Taxes				7	
Property Insurance				6	
Investment Repairs				12	
TOTAL CASH OVERHEAD COSTS/ACRE				1,509	
TOTAL CASH COSTS/ACRE				8,994	

UC COOPERATIVE EXTENSION
Table 2. CONTINUED
 CENTRAL COAST 2009

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
NON-CASH OVERHEAD COSTS (Capital Recovery):					
Building				25	
Shop Tools				6	
Fuel Tanks				1	
Pipe - Sprinkler				8	
Trailer - Pipe #1				2	
Trailer - Pipe #2				2	
Equipment				74	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				117	
TOTAL COSTS/ACRE				9,112	
NET RETURNS ABOVE TOTAL COSTS				2,138	

UC COOPERATIVE EXTENSION

Table 3. MONTHLY CASH COSTS PER ACRE TO PRODUCE LETTUCE

CENTRAL COAST 2009

Beginning OCT 08	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	TOTAL
Ending NOV 09	08	08	08	09	09	09	09	09	09	09	09	09	09	09	
Cultural:															
Fertilize: Gypsum/Compost (1/2 cost to lettuce)	151														151
Land Prep: Sub Soil, (1/2 cost to lettuce)	64														64
Land Prep: Disc & Roll 2X (1/2 cost to lettuce)	31														31
Land Prep: Chisel 2X (1/2 cost to lettuce)	37														37
Land Prep: Land plane field 2X (1/2 cost to lettuce)	26														26
Cover Crop: Plant 1X/2Yr (1/4 cost to lettuce)	39														39
Cover Crop: Mow 1X/2Yr (1/4 cost to lettuce)						3									3
Cover Crop: Disc 2X/2Yr (1/4 cost to lettuce)						8									8
Land Prep: Disc & Roll 1X											16				16
Land Prep: List Beds/Fertilize: (Pelleted Chicken Manure)											275				275
Irrigate: Preirrigate - Sprinkle											44				44
Weed: Cultivate 2X (Rolling Cultivator)											14				14
Land Prep: Shape beds & roll											15				15
Plant: Lettuce											169				169
Insect: Plant Insectory (Alyssum Seed)											4				4
Irrigate: Sprinkle 3X											44	22			65
Stand Establishment: Thin. Weed: Hand Hoe												219			219
Weed: Cultivate												7			7
Irrigate: Lay drip line and laterals (drip tape)												301			301
Fertilize: Sidedress 1X (Bloodmeal)												347			347
Irrigate: Drip 5X												27	56	27	110
Fertilize: through drip (Phytamin)												29	58		88
Pest: Worms (Dipel)/Aphid (Pyganic)												91			91
Weed: Cultivate/Furrow 2X (Break Bottoms)												7	7		13
Weed: Hand Hoe													162		162
Irrigate: Retrieve Drip and Laterals														175	175
Pest: Pest Management Consultant											8	8	8	8	30
Pickup use	6					6					11	11	11	11	56
TOTAL CULTURAL COSTS	353					16					598	1,068	302	221	2,557
Harvest:															
Cut, Pack, Haul														3,113	3,113
Cool, Palletize, Sell														1,725	1,725
TOTAL HARVEST COSTS														4,838	4,838
Postharvest:															
Chop stubble														11	11
TOTAL POSTHARVEST COSTS														11	11
Interest on operating capital @ 5.75%	2	2	2	2	2	2	2	2	2	2	5	10	11	35	80
TOTAL OPERATING COSTS/ACRE	354	2	2	2	2	18	2	2	2	2	603	1,078	313	5,104	7,485

UC COOPERATIVE EXTENSION

Table 3. CONTINUED

CENTRAL COAST 2009

Beginning OCT 08	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	TOTAL
Ending NOV 09	08	08	08	09	09	09	09	09	09	09	09	09	09	09	
OVERHEAD:															
Land Rent												1,200			1,200
Office Expense	25										25	25	25	25	127
Field Sanitation													31	31	63
Liability Insurance														2	2
Annual Organic Certification Fees														90	90
Property Taxes	7														7
Property Insurance	6														6
Investment Repairs	1					1					2	2	2	2	12
TOTAL CASH OVERHEAD COSTS	40					1					28	1,230	59	151	1,509
TOTAL CASH COSTS/ACRE	394	2	2	2	2	19	2	2	2	2	630	2,308	372	5,255	8,994

UC COOPERATIVE EXTENSION
Table 4. RANGING ANALYSIS FOR ORGANIC LEAF LETTUCE
 CENTRAL COAST - 2009

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE ORGANIC LEAF LETTUCE

	YIELD (25 lb box/acre)						
	550	650	750	850	950	1,050	1,150
OPERATING COSTS/ACRE:							
Cultural Cost	2,557	2,557	2,557	2,557	2,557	2,557	2,557
Harvest Cost	3,548	4,192	4,838	5,482	6,128	6,772	7,418
Postharvest Cost	11	11	11	11	11	11	11
Interest on operating capital @ 5.75 %	74	77	80	83	86	89	92
<i>TOTAL OPERATING COSTS/ACRE</i>	6,190	6,837	7,486	8,133	8,782	9,429	10,078
<i>TOTAL OPERATING COSTS/box</i>	11.25	10.52	9.98	9.57	9.24	8.98	8.76
CASH OVERHEAD COSTS/ACRE							
<i>TOTAL CASH COSTS/ACRE</i>	7,699	8,346	8,994	9,642	10,291	10,938	11,587
<i>TOTAL CASH COSTS/box</i>	14.00	12.84	11.99	11.34	10.83	10.42	10.08
NON-CASH OVERHEAD COSTS/ACRE							
<i>TOTAL COSTS/ACRE</i>	7,816	8,463	9,112	9,759	10,408	11,055	11,704
<i>TOTAL COSTS/box</i>	14.21	13.02	12.15	11.48	10.96	10.53	10.18

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE \$/box	YIELD (25 lb box/acre)						
	550	650	750	850	950	1,050	1,150
10.50	-415	-12	389	792	1,193	1,596	1,997
12.00	410	963	1,514	2,067	2,618	3,171	3,722
13.50	1,235	1,938	2,639	3,342	4,043	4,746	5,447
15.00	2,060	2,913	3,764	4,617	5,468	6,321	7,172
16.50	2,885	3,888	4,889	5,892	6,893	7,896	8,897
18.00	3,710	4,863	6,014	7,167	8,318	9,471	10,622
19.50	4,535	5,838	7,139	8,442	9,743	11,046	12,347

NET RETURNS PER ACRE ABOVE CASH COSTS

PRICE \$/box	YIELD (25 lb box/acre)						
	550	650	750	850	950	1,050	1,150
10.50	-1,924	-1,521	-1,120	-717	-316	87	488
12.00	-1,099	-546	5	558	1,109	1,662	2,213
13.50	-274	429	1,130	1,833	2,534	3,237	3,938
15.00	551	1,404	2,255	3,108	3,959	4,812	5,663
16.50	1,376	2,379	3,380	4,383	5,384	6,387	7,388
18.00	2,201	3,354	4,505	5,658	6,809	7,962	9,113
19.50	3,026	4,329	5,630	6,933	8,234	9,537	10,838

NET RETURNS PER ACRE ABOVE TOTAL COSTS

PRICE \$/box	YIELD (25 lb box/acre)						
	550	650	750	850	950	1,050	1,150
10.50	-2,041	-1,638	-1,237	-834	-433	-30	371
12.00	-1,216	-663	-112	441	992	1,545	2,096
13.50	-391	312	1,013	1,716	2,417	3,120	3,821
15.00	434	1,287	2,138	2,991	3,842	4,695	5,546
16.50	1,259	2,262	3,263	4,266	5,267	6,270	7,271
18.00	2,084	3,237	4,388	5,541	6,692	7,845	8,996
19.50	2,909	4,212	5,513	6,816	8,117	9,420	10,721

UC COOPERATIVE EXTENSION
Table 5. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS
 CENTRAL COAST -2009

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
						Insur- ance	Taxes	
09	130 HP 2WD Tractor	102,000	10	30,129	10,626	542	661	11,828
09	280 HP Track Tractor	221,862	10	65,535	23,113	1,178	1,437	25,728
09	80 HP Specialty Tractor	51,000	10	15,065	5,313	271	330	5,914
09	Bed Shaper 4R 13'	10,000	12	1,385	1,024	47	57	1,128
09	Chisel - Heavy 16'	9,333	12	1,293	956	44	53	1,052
09	Cultivate Rolling 13'	8,292	10	1,466	943	40	49	1,032
09	Cultivator 4R 13'	2,500	10	442	284	12	15	311
09	Disc - Finish 21'	28,451	12	3,941	2,914	133	162	3,208
09	Fertilizer Rig - Gandy 4R 13'	4,285	10	758	487	21	25	533
09	Mower-Flail 13'	12,749	10	2,255	1,450	62	75	1,586
09	Pickup 1/2 Ton	32,000	5	14,342	4,732	190	232	5,153
09	Planter Grain Drill 15'	21,427	15	2,057	1,932	96	117	2,146
09	Planter Jr 1-Bed 2R 3'	1,315	10	233	150	6	8	164
09	Planter Precision 4R	17,521	10	3,098	1,992	85	103	2,180
09	Ringroller - 21'	4,200	10	743	478	20	25	523
09	Roller - Flat 16'	2,500	12	346	256	12	14	282
09	Subsoiler - 8'	5,052	10	893	575	24	30	629
09	Tape Laying Machine 4R 13'	13,276	20	692	1,021	57	70	1,148
09	Tape Retrieval Machine 4R 13'	6,480	20	338	499	28	34	561
09	Triplane - 16'	22,000	12	3,047	2,253	103	125	2,481
TOTAL		576,243		148,058	60,996	2,970	3,621	67,588
60% of New Cost *		345,746		88,835	36,598	1,782	2,173	40,553

*Used to reflect a mix of new and used equipment
 R = row as 4R = 4 rows

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insur- ance	Taxes	Repairs	
Building 2400 sqft	80,000	32		4,913	328	400	1,600	7,241
Fuel Tank OH 2-300g	4,500	30	350	279	20	24	90	413
Pipe Sprinkler 1456'	13,200	10		1,689	54	66	264	2,073
Shop Tools	15,000	20	1,307	1,138	67	82	300	1,586
Trailer - Pipe #1	2,100	7	210	334	9	12	42	397
Trailer - Pipe #2	2,100	7	210	334	9	12	42	397
TOTAL INVESTMENT	116,900		2,077	8,685	488	595	2,338	12,106

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Annual Organic Certification (Lettuce portion)	5	acre	90.00	450
Field Sanitation	5	acre	62.88	314
Food Safety Certification	200	acre	5.00	1,000
Land Rent (Lettuce portion)	5	acre	1,200.00	6,000
Liability Insurance	200	acre	4.31	862
Office Expense	200	acre	250.00	50,000

UC COOPERATIVE EXTENSION
Table 6. HOURLY EQUIPMENT COSTS
 CENTRAL COAST - 2009

Yr	Description	Actual	Cash Overhead			Operating		Total Costs/Hr.	
		Hours Used	Capital Recovery	Insur- ance	Taxes	Repairs	Fuel & Lube		Total Oper.
09	130 HP 2WD Tractor	1,200	5.31	0.27	0.33	4.75	32.10	36.85	42.76
09	280 HP Track Tractor	1,600	8.67	0.44	0.54	5.90	69.14	75.04	84.69
09	80 HP Specialty Tractor	1,200	2.66	0.14	0.17	2.38	19.22	21.60	24.57
09	Bed Shaper 4R 13'	166	3.70	0.17	0.21	2.09	0.00	2.09	6.17
09	Chisel - Heavy 16'	166	3.46	0.16	0.19	1.97	0.00	1.97	5.78
09	Cultivate Rolling 13'	200	2.83	0.11	0.15	1.70	0.00	1.70	4.79
09	Cultivator 4R 13'	200	0.85	0.04	0.04	0.52	0.00	0.52	1.45
09	Disc - Finish 21'	167	10.50	0.48	0.58	4.62	0.00	4.62	16.18
09	Fertilizer Rig - Gandy 4R 13'	120	2.44	0.10	0.13	1.66	0.00	1.66	4.33
09	Mower-Flail 13'	200	4.34	0.18	0.22	5.38	0.00	5.38	10.12
09	Pickup 1/2 Ton	285	9.96	0.40	0.49	2.08	16.10	18.18	29.03
09	Planter Grain Drill 15'	99	11.69	0.58	0.71	5.65	0.00	5.65	18.63
09	Planter Jr 1-Bed 2R 3'	149	0.60	0.03	0.03	0.36	0.00	0.36	1.02
09	Planter Precision 4R	150	7.95	0.34	0.41	4.83	0.00	4.83	13.53
09	Ringroller - 21'	200	1.43	0.06	0.07	0.48	0.00	0.48	2.04
09	Roller - Flat 16'	166	0.92	0.04	0.05	0.28	0.00	0.28	1.29
09	Subsoiler - 8'	200	1.72	0.07	0.09	1.15	0.00	1.15	3.03
09	Tape Laying Machine 4R 13'	125	4.90	0.27	0.34	2.01	0.00	2.01	7.52
09	Tape Retrieval Machine 4R 13'	120	2.50	0.14	0.17	0.97	0.00	0.97	3.78
09	Triplane - 16'	250	5.40	0.25	0.30	3.36	0.00	3.36	9.31

UC COOPERATIVE EXTENSION
Table 7. OPERATIONS WITH EQUIPMENT – ORGANIC LEAF LETTUCE
 CENTRAL COAST 2009

Operation	Operation Month	Tractor	Implement	Material	Broadcast Rate/acre	Unit
Cultural:						
Fertilizer: Compost	October	Custom		Manure/Green Waste Compost	2.50	ton
				Gypsum	0.50	ton
Land Prep: Sub Soil 1/2 cost	October	280 HP Track	Subsoiler 8'			
Land Prep: Disc & Roll 2X	October	280 HP Track	Disc Finish 21'			
			Ringroller 21'			
Land Prep: Chisel 2X	October	280 HP Track	Chisel 16'			
Land Prep: Landplane 2X	October	280 HP Track	Triplane 16'			
Cover Crop: Plant 1X/2Yr	October	130 HP 2WD	Grain Drill 15'	Cover Crop Seed	30.00	lb
Cover Crop: Chop 1X/2Yr	March	130 HP 2WD	Mower-Flail 13'			
Cover Crop: Disc 1X/2Yr	March	280 HP Track	Disc Finish 21'			
Land Prep: Disc & Roll	August	280 HP Track	Disc Finish 21'			
			Ringroller 21'			
Land Prep: List Beds. Fertilize: Preplant	August	Custom		Pelleted Chicken Manure	1,000	lb
Land Prep: Shape Beds & Roll	August	130 HP 2WD	Bed Shaper 13'			
			Roller Flat 16'			
Plant: Lettuce	August	130 HP 2WD	Precision Planter	Lettuce Seed	148.20	thou
Insect: Plant Insectary	August	92 HP 2WD	Planter Jr	Alyssum	0.05	lb
Insect: Worms/Aphid	September	Custom		Dipel	1.00	lb
				Pyganic	2.00	pt
Irrigate: Sprinkle - Preirrigation	August			Water	2.00	acin
Irrigate: Sprinkler 3X	August			Water	1.00	acin
	August			Water	1.00	acin
	September			Water	1.00	acin
Irrigate: Drip	September			Water	3.00	acin
	October			Water	6.00	acin
	November			Water	3.00	acin
Irrigate: Layout Drip & Laterals	September	92 HP 2WD	Tape Machine	Labor	3.10	hr
				Drip Tape 1/2 of tape	6,541	ft
Irrigate: Retrieve Drip	November	92 HP 2WD	Tape Retrieval Machine	Labor	6.00	hr
Fertilize: Sidedress	September	92 HP 2WD	Gandy 13'	Bloodmeal	450.00	lb
Fertilize :Drip	September			Phytamin	57.00	lb
	October			Phytamin	57.00	lb
	October			Phytamin	57.00	lb
Land Prep: Cultivate 2X	August	130 HP 2WD	Rolling Cultivator			
	August	130 HP 2WD	Rolling Cultivator			
Weed: Cultivate	September	130 HP 2WD	Cultivator 13'			
Weed: Cultivate & Furrow 2X	September	130 HP 2WD	Cultivator 13'			
	October	130 HP 2WD	Cultivator 13'			
Weed: Hand Hoe	October			Labor	12.00	hr
Stand Establish: Thin.	September			Labor	16.25	hr
Harvest: Cut Pack Haul	November	Contract				
Harvest: Cool, Palletize, Sell	November	Contract				
Post Harvest: Chop Stubble	November	130 HP 2WD	Mower-Flail 13'			