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UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2004

SAMPLE COSTS TO PRODUCE
ORGANIC
LEAF LETTUCE

CENTRAL COAST REGION
Monterey & Santa Cruz Counties

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UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

SAMPLE COSTS TO PRODUCE ORGANIC LEAF LETTUCE - Central Coast Region 2004

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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 – Monterey and Santa Cruz Counties - are presented in this study. The study is intended as a guide only, and can be used to make production decisions, determine potential returns, prepare budgets and evaluate production loans. The practices described are based on production procedures considered typical for this crop and area, 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) 752-4424 or from local county UC Cooperative Extension offices.

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 – Monterey and Santa Cruz 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 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 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 (in this study, cost is allocated to two crops), disced and rolled two times, then chiseled twice, followed by two passes with a landplane. 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) 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 chopped in March of the first year and incorporated into the soil with a single discing. 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. A hybrid 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 a 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. Two and one-half tons of compost (manure/green waste) and one-half ton of gypsum 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, an organic liquid fertilizer, is applied through the drip system at five-gallons or 48.75 pounds per acre three times (September 1X; October 2X), totaling 15 gallons or 146.25 pounds (10.25 lbs N) per season. 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 $160.00 per acre-foot or $13.33 per acre-inch. The water cost includes pumping and water district/agency fees. Water costs vary considerably depending upon water district and pumping variables. A pre-irrgation 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 13.00 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 18.00 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 $1.48 for the box (carton), $2.19 per box for harvest labor, $0.18 per box for field overhead (supervisors) which brings the field harvest cost to $3.85 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 $4.95 per box. Selling costs are 8% of the market price and $0.72 cents per box is used in this study.

Yields. The crop yield used in this study 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 lettuce delivered and sold through grower-shipper channels is assumed for this study to be $9.00 per 25-pound box. Typical returns over years ranges from $6.00 to $12.00 per box. The ranging analysis in Table 4 shows the net returns above operating costs, cash costs and total costs for a range of prices and yields.

Assessments. 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 in this study for the state and certifying agencies, the annual membership fee and crop inspection are converted to a $25 per acre fee. Other fees may be applicable, but are not assessed in this study. Some certifying agencies charge a non-refundable application fee to new growers. Thereafter an annual fee based on total organic farm income is assessed, 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 travel expenses.

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. Labor rates of $13.84 per hour for machine operators and $11.81 for general labor includes payroll overhead of 35%. The basic hourly wages are $10.25 for machine operators and $8.75 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, 2004 (California Department of Insurance). Labor for operations involving machinery are 20% higher than the operation time given in Table 1 to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and field repair.

Equipment Operating Costs. Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by the American Society of Agriculture Engineers (ASAE). Fuel and lubrication costs are also determined by ASAE equations based on maximum Power Take-Off (PTO) horsepower, and fuel type. Average prices in January 2004 for on-farm delivery of diesel and gasoline are $1.45 and $1.88 per gallon, respectively. The fuel prices are averaged based on four California delivery locations plus $0.24 per gallon, which is one-half the difference between the high and low price for regular gasoline in 2003 from the California State Automobile Association Monthly Survey. The cost includes a 2.25% sales tax (effective September 2001) on diesel fuel and 7.25% sales tax on gasoline. Gasoline also includes federal and state excise tax, which can be refunded for on-farm use when filing your income tax. The fuel, lube, and repair cost per acre for each operation in Table 1 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.

Interest On Operating Capital. Interest on operating capital is based on cash operating costs and is calculated monthly until harvest at a nominal rate of 6.89% per year. A nominal interest rate is the typical market cost of borrowed funds. The interest cost of post harvest operations is discounted back to the last harvest month using a negative interest charge.

Risk. 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. These costs include property taxes, interest on operating capital, office expense, rent, liability and property insurance, and investment repairs. Because overhead costs are farm and ranch specific, costs will vary among growers.

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 0.676% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs $715 for the entire farm or $3.58 per acre.

Office Expense. Annual office and business expenses are estimated at $200 per acre. Being two crops are grown on the same acres, $100 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 $800 to $2,400 per acre. In this study, land rented for lettuce production is $1,000 per acre. 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.

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 ((Purchase Price – Salvage Value) X Capital Recovery Factor) + (Salvage Value X 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 6.23% used to calculate capital recovery cost is the USDA-ERS's ten-year average of California's agricultural sector long-run rate of return to production assets from current income. It is used to reflect the long-term realized rate of return to these specialized resources that can only be used effectively in the agricultural sector.

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.

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. Tables revised February 14, 2005. Downey Mildew control deleted as a cost.

REFERENCES

Agricultural Commissioner. *Annual Crop Reports.* 1999-2002. Monterey County. Salinas, CA.

American Society of Agricultural Engineers. (ASAE). 1992. *American Society of Agricultural Engineers Standards Yearbook*. St. Joseph, MO.

Boehlje, Michael D., and Vernon R. Eidman. 1984. *Farm Management*. John Wiley and Sons. New York, New York

California Association of Winegrape Growers. 2003. *Farm Employers Labor Survey, All Crops, Central Coast.* California Association of Winegrape Growers. Sacramento, CA.

California Chapter of the American Society of Farm Managers and Rural Appraisers. 2003 *Trends in Agricultural Land & Lease Values.* American Society of Farm Managers and rural Appraisers, Woodbridge, CA.

Doane Editors. 1984. *Facts and Figures for Farmers.* Doane Publishing, St. Louis, MO.

Integrated Pest Management Education and Publications. 1999. "UC Pest Management Guidelines: Cole Crops." In M. L. Flint (ed.) *UC IPM Pest Management Guidelines*. University of California. Division of Agriculture and Natural Resources. Oakland, CA. Publication 3339.

Jackson, Louise Keith S. Mayberry, Frank Laemmlen, Steven T. Koike, and William Chaney. 1996. *Leaf Lettuce Production in California.* University of California, Division of Agriculture and Natural Resources, Vegetable Research and Information Center. Publication 7216.

Tourte, Laura, Richard Smith. 2000-2001. *Sample Production Costs for Romaine Lettuce, Monterey and Santa Cruz Counties.* University of California, Cooperative Extension. Santa Cruz and Monterey, CA.

USDA-ERS. 2004. *Farm Sector: Farm Financial Ratios*. Agriculture and Rural Economics Division, ERS. USDA. Washington, DC http://www.ers.usda.gov/data/farmbalancesheet/fbsdmu.htm; Internet; accessed January 5, 2005.

For information concerning the above or other University of California publications, contact or your local county UC Cooperative Extension office or UC DANR Communications Services online at http://ucanr.org.

UC COOPERATIVE EXTENSION

Table 1. COST PER ACRE TO PRODUCE ORGANIC LEAF LETTUCE

CENTRAL COAST 2004

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per Acre					
		Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent	Total Cost	Your Cost
Cultural:							
Fertilize: Preplant (Gyspum, Compost)	0.00	0	0	119	0	119	
Land Prep: Sub Soil, 1/2 cost	0.61	10	22	0	0	32	
Land Prep: Disc & Roll 2X	0.29	5	11	0	0	16	
Land Prep: Chisel 2X	0.35	6	13	0	0	19	
Land Prep: Land plane field 2X	0.24	4	9	0	0	13	
Cover Crop: Plant 1X/2Yr	0.08	1	2	11	0	14	
Cover Crop: Chop 1X/2Yr	0.08	1	2	0	0	3	
Cover Crop: Disc 1X/2Yr	0.07	1	3	0	0	4	
Land Prep: Disc & Roll 1X	0.14	2	6	0	0	8	
Land Prep: List Beds. Fertilize: (Pelleted Chicken Manure)	0.00	0	0	100	0	100	
Irrigate: Preirrigate - Sprinkle	2.00	24	0	27	0	50	
Land Prep: Cultivate 2X (Rolling Cultivator)	0.21	4	4	0	0	8	
Land Prep: Shape beds & roll	0.23	4	4	0	0	8	
Plant: Lettuce	0.28	7	6	90	0	103	
Insect: Plant Insectory (Alyssum)	0.07	1	1	1	0	3	
Irrigate: Sprinkle 3X	3.00	35	0	40	0	75	
Stand Establishment: Thin. Weed: (hand hoe)	16.25	192	0	0	0	192	
Irrigate: Lay drip line and laterals (drip tape)	1.00	53	10	131	0	194	
Fertilize: Sidedress 1X (Bloodmeal)	0.20	3	2	203	0	208	
Irrigate: Drip 5X	0.75	9	0	173	0	182	
Fertilize: through drip (Phytamin)	0.00	0	0	51	0	51	
Pest: Worms (Dipel)/Aphid (Pyganic)	0.00	0	0	57	16	73	
Weed: Cultivate & Furrow 2X (Break Bottoms)	0.21	4	4	0	0	7	
Weed: Hand Hoe	12.00	142	0	0	0	142	
Irrigate: Retrieve Drip and Laterals	1.50	96	18	220	0	114	
Pest Management Consultant	0.00	0	0	0	30	30	
Pickup use	1.43	23	15	0	0	39	
TOTAL CULTURAL COSTS	40.99	627	131	1,002	46	1,807	
Harvest:							
Cut, Pack, Haul	0.00	0	0	0	2,888	2,888	
Cool, Palletize, Sell	0.00	0	0	0	1,365	1,365	
TOTAL HARVEST COSTS	0.00	0	0	0	4,253	4,253	
Assessments:							
Organic Certification	0.00	0	0	25	0	25	
TOTAL ASSESSMENT COSTS	0.00	0	0	25	0	25	
Postharvest:							
Chop stubble	0	3	4	0	0	6	
TOTAL POSTHARVEST COSTS	0	6	6	0	0	6	
Interest on operating capital @ 6.89%						57	
TOTAL OPERATING COSTS/ACRE		630	136	1,027	4,299	6,148	
Cash Overhead:							
Land Rent						1,000	
Office Expense						101	
Field Sanitation						1	
Liability Insurance						4	
Property Taxes						6	
Property Insurance						4	
Investment Repairs						10	
TOTAL CASH OVERHEAD COSTS						1,126	
TOTAL CASH COSTS/ACRE*						7,273	

UC COOPERATIVE EXTENSION
Table 1. continued

Non-Cash Overhead:	Per Producing Acre	Annual Cost Capital Recovery	Total	Your Costs
Building 2,400 sqft	300	22	22	
Shop Tools	65	6	6	
Fuel Tank OH 2-300 gal	18	1	1	
Pipe Sprinkler 1,456'	46	6	6	
Trailer – Pipe #1	11	2	2	
Trailer - Pipe #2	11	2	2	
Equipment	523	62	62	
TOTAL NON-CASH OVERHEAD COSTS	973	100	100	
TOTAL COSTS/ACRE			7,373	

*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. ($7,273 - $4,253 = $3,020).

UC COOPERATIVE EXTENSION

Table 2. COSTS AND RETURNS PER ACRE TO PRODUCE ORGANIC LEAF LETTUCE

CENTRAL COAST 2004

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS: Organic Lettuce	750.00	box	9.00	6,750	
Operating Costs:					
Fertilizer/Soil Amendments:					
Compost – Manure/Green Waste (Haul/Spread)	2.50	ton	40.00	100	
Gypsum	0.50	ton	38.50	19	
Pelleted Chicken Manure (List Beds/Fertilize)	1,000.00	lb	0.10	100	
13-0-0 Bloodmeal	450.00	lb	0.45	203	
7-0-0 Phytamin 800 (9.75 lbs/gallon)	146.25	lb	0.35	51	
Seed:					
Cover Crop (cereal/legume mix)	30.00	lb	0.35	11	
Leaf Lettuce (pelleted, organic)	148.20	thou	0.61	90	
Alyssum	0.05	lb	13.00	1	
Irrigation:					
Water-Pumped	18.00	acin	13.33	240	
Drip Tape (10mil) 1/2 cost	6,541.00	foot	0.02	131	
Insecticide:					
Dipel DF	1.00	lb	13.55	14	
Pyganic 1.4 EC	2.00	pint	21.75	44	
Contract:					
Ground Application (disease)	1.00	acre	16.00	16	
Harvest (box, pick, haul, supervision)	750.00	box	3.85	2,888	
Harvest (palletize, cool)	750.00	box	1.10	825	
Sell Commission 8% of $9	750.00	box	0.72	540	
Pest Management Consultant	1.00	acre	30.00	30	
Assessment:					
Organic Production & Certification Fees	1.00	acre	25.00	25	
Labor (machine)	8.59	hrs	13.84	118	
Labor (non-machine)	43.28	hrs	11.81	511	
Fuel - Gas	5.95	gal	1.88	11	
Fuel – Diesel	54.53	gal	1.45	79	
Lube				14	
Machinery repair				32	
Interest on operating capital @ 6.89%				57	
TOTAL OPERATING COSTS/ACRE				6,148	
NET RETURNS ABOVE OPERATING COSTS				602	
Cash Overhead:					
Land Rent				1,000	
Office Expense				100	
Field Sanitation				1	
Liability Insurance				4	
Property Taxes				6	
Property Insurance				4	
Investment Repairs				10	
TOTAL CASH OVERHEAD COSTS/ACRE				1,126	
TOTAL CASH COSTS/ACRE				7,273	

UC COOPERATIVE EXTENSION

Table 2. continued

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
Non-Cash Overhead (Capital Recovery):					
Building 2,400 sqft				22	
Shop Tools				6	
Fuel Tank OH 2-300g				1	
Pipe Sprinkler 1,456'				6	
Trailers - Pipe (2)				4	
Equipment				62	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				100	
TOTAL COSTS/ACRE				7,373	
NET RETURNS ABOVE TOTAL COSTS				-623	

UC COOPERATIVE EXTENSION

Table 3. MONTHLY CASH COSTS PER ACRE TO PRODUCE ORGANIC LEAF LETTUCE

CENTRAL COAST 2004

Beginning OCT 03 Ending NOV 04	OCT 03	NOV 03	DEC 03	JAN 04	FEB 04	MAR 04	APR 04	MAY 04	JUN 04	JUL 04	AUG 04	SEP 04	OCT 04	NOV 04	TOTAL
Cultural:															
Fertilize: (Gypsum, Compost)	119														119
Land Prep: Sub Soil, 1/2 cost	32														32
Land Prep: Disc & Roll 2X	16														16
Land Prep: Chisel 2X	19														19
Land Prep: Land plane field 2X	13														13
Cover Crop: Plant 1X/2Yr	14														14
Cover Crop: Chop 1X/2Yr						3									3
Cover Crop: Disc 1X/2Yr						4									4
Land Prep: Disc & Roll 1X											8				8
Land Prep: List. Fertilize: (Chicken Manure)											100				100
Irrigate: Preirrigate (Sprinkle)											50				50
Land Prep: Cultivate 2X (Rolling Cultivator)											8				8
Land Prep: Shape beds & roll											8				8
Plant: Lettuce											103				103
Insect: Plant Insectory (Alyssum)											3				3
Irrigate: Sprinkle 3X											50	25			75
Stand Establishment: Thin. Weed: Hand Hoe												192			192
Irrigate: Lay drip lines & laterals (drip tape)												194			194
Fertilize: Sidedress 1X (Bloodmeal)												208			208
Irrigate: Drip (water & labor)												46	91	46	182
Fertilize: through drip 3X (Phytamin)												17	34		51
Pest: Worms (Dipel)/Aphid(Pyganic)												73			73
Weed: Cultivate/Furrow 2X (break bottoms)													7		7
Weed: Hand Hoe													142		142
Irrigate: Retrieve Drip & laterals														114	114
Pest Management Consultant											7	7	7	7	30
Pickup use	8										8	8	8	8	39
TOTAL CULTURAL COSTS	221	0	0	0	0	7	0	0	0	0	345	769	288	175	1,807
Harvest:															
Cut, Pack, Haul														2,888	2,888
Cool, Palletize, Sell														1,365	1,365
TOTAL HARVEST COSTS														4,253	4,253
Assessment:															
Organic Certification														25	25
TOTAL ASSESSMENT														25	25
Postharvest:															
Chop stubble														6	6
TOTAL POSTHARVEST COSTS														6	6
Interest on operating capital	1	0	0	0	0	0	0	0	0	0	3	8	10	35	57
TOTAL OPERATING COSTS/ACRE	222	0	0	0	0	7	0	0	0	0	347	777	297	4,494	6,148
Overhead:															
Land Rent												1,000			1,000
Office Expense	20	0	0	0	0	0	0	0	0	0	20	20	20	20	100
Field Sanitation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Liability Insurance														4	4
Property Taxes	6														6
Property Insurance	4														4
Investment Repairs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10
TOTAL CASH OVERHEAD COSTS	31	1	1	1	1	1	1	1	1	1	21	1,021	21	25	1,125
TOTAL CASH COSTS/ACRE	253	1	1	1	1	8	1	1	1	1	368	1,798	318	4,519	7,273

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Table 4. RANGING ANALYSIS FOR ORGANIC LEAF LETTUCE

CENTRAL COAST - 2004

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE ORGANIC LEAF LETTUCE

	YIELD (25 lb box/acre)						
	500	600	700	750	800	900	1,000
OPERATING COSTS/ACRE:							
Cultural Cost	1,807	1,807	1,807	1,807	1,807	1,807	1,807
Harvest Cost	2,835	3,402	3,969	4,253	4,536	5,103	5,670
Assessment Cost*	25	25	25	25	25	25	25
Postharvest Cost	6	6	6	6	6	6	6
Interest on operating capital	50	53	56	58	59	63	66
TOTAL OPERATING COSTS/ACRE	4,723	5,293	5,863	6,149	6,433	7,004	7,574
TOTAL OPERATING COSTS/box	9.45	8.82	8.38	8.20	8.04	7.78	7.57
CASH OVERHEAD COSTS/ACRE	1,126	1,126	1,126	1,126	1,126	1,126	1,126
TOTAL CASH COSTS/ACRE	5,849	6,419	6,989	7,275	7,559	8,130	8,700
TOTAL CASH COSTS/box	11.70	10.70	9.98	9.70	9.45	9.03	8.70
NON-CASH OVERHEAD COSTS/ACRE	100	100	100	100	100	100	100
TOTAL COSTS/ACRE	5,949	6,519	7,089	7,375	7,659	8,230	8,800
TOTAL COSTS/box	11.90	10.87	10.13	9.83	9.57	9.14	8.80

*Varies by gross income and other factors

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE	YIELD (25 lb box/acre)						
$/box	500	600	700	750	800	900	1,000
6.00	-1,723	-1,693	-1,663	-1,649	-1,633	-1,604	-1,574
7.00	-1,223	-1,093	-963	-899	-833	-704	-574
8.00	-723	-493	-263	-149	-33	196	426
9.00	-223	107	437	601	767	1,096	1,426
10.00	277	707	1,137	1,351	1,567	1,996	2,426
11.00	777	1,307	1,837	2,101	2,367	2,896	3,426
12.00	1,277	1,907	2,537	2,851	3,167	3,796	4,426

NET RETURNS PER ACRE ABOVE CASH COSTS

PRICE	YIELD (25 lb box/acre)						
$/box	500	600	700	750	800	900	1,000
6.00	-2,849	-2,819	-2,789	-2,775	-2,759	-2,730	-2,700
7.00	-2,349	-2,219	-2,089	-2,025	-1,959	-1,830	-1,700
8.00	-1,849	-1,619	-1,389	-1,275	-1,159	-930	-700
9.00	-1,349	-1,019	-689	-525	-359	-30	300
10.00	-849	-419	11	225	441	870	1,300
11.00	-349	181	711	975	1,241	1,770	2,300
12.00	151	781	1,411	1,725	2,041	2,670	3,300

NET RETURNS PER ACRE ABOVE TOTAL COSTS

PRICE	YIELD (25 lb box/acre)						
$/box	500	600	700	750	800	900	1,000
6.00	-2,949	-2,919	-2,889	-2,875	-2,859	-2,830	-2,800
7.00	-2,449	-2,319	-2,189	-2,125	-2,059	-1,930	-1,800
8.00	-1,949	-1,719	-1,489	-1,375	-1,259	-1,030	-800
9.00	-1,449	-1,119	-789	-625	-459	-130	200
10.00	-949	-519	-89	125	341	770	1,200
11.00	-449	81	611	875	1,141	1,670	2,200
12.00	51	681	1,311	1,625	1,941	2,570	3,200

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Table 5. WHOLE FARM ANNUAL EQUPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS

CENTRAL COAST -2004

ANNUAL EQUIPMENT COSTS

						Cash Overhead		
Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur-ance	Taxes	Total
04	130 HP 2WD Tractor	62,500	10	18,462	7,199	274	405	7,877
04	280 HP Crawler	180,000	10	53,169	20,733	788	1,166	22,687
04	92 HP 2WD Tractor	39,775	10	11,749	4,581	174	258	5,013
04	Bed Shaper 4 Row 13'	4,600	12	637	518	18	26	562
04	Chisel - Heavy 16'	9,333	12	1,293	1,052	36	53	1,141
04	Cultivate Rolling 13'	8,292	10	1,466	1,029	33	49	1,111
04	Cultivator 4 Row 13'	2,500	10	442	310	10	15	335
04	Disc - Finish 21'	19,595	12	2,714	2,208	75	112	2,395
04	Fertilizer Rig - Gandy 4 Row 13'	3,022	10	534	375	12	18	405
04	Mower-Flail 13'	12,749	10	995	1,676	46	69	1,792
04	Pickup 1/2 Ton	28,000	5	12,549	4,473	137	203	4,813
04	Planter Grain Dril1	18,000	15	1,728	1,808	67	99	1,974
04	Planter Jr 1-Bed 2 Row 3'	1,100	10	195	136	4	6	147
04	Planter Precision 4 Row	17,521	10	3,098	2,174	70	103	2,347
04	Ringroller - 21'	4,200	10	743	521	17	25	563
04	Roller - Flat 16'	2,300	12	319	259	9	13	281
04	Subsoiler - 8'	8,022	10	1,419	995	32	47	1,074
04	Tape Laying Machine 4 Row 13'	1,500	20	78	131	5	8	144
04	Tape Retrieval Machine 4 Row 13'	12,000	20	417	1,055	42	62	1,159
04	Triplane - 16'	20,109	12	2,785	2,266	77	114	2,458
	TOTAL	455,118		116,260	53,399	1,932	2,857	58,190
	60% of New Cost *	273,071		69,756	32,041	1,159	1,714	34,913

*Used to reflect a mix of new and used equipment

ANNUAL INVESTMENT COSTS

					Cash Overhead			
Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur-ance	Taxes	Repairs	Total
Building 2,400 sqft	60,000	32		4,370	203	300	1,200	6,073
Fuel Tank OH 2-300g	3,500	30	350	256	13	19	70	359
Pipe Sprinkler 1,456'	9,279	10	928	1,205	35	51	510	1,800
Shop Tools	13,072	20	1,307	1,126	49	72	131	1,378
Trailer - Pipe #1	2,100	7	210	354	8	12	42	416
Trailer - Pipe #2	2,100	7	210	354	8	12	42	416
TOTAL INVESTMENT	90,051		3,005	7,666	315	465	1,995	10,441

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Field Sanitation	5	acre	57.60	288
Land Rent	5	acre	1,000.00	5,000
Liability Insurance	200	acre	3.58	716
Office Expense	200	acre	200.00	40,000

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Table 6. HOURLY EQUIPMENT COSTS

CENTRAL COAST - 2004

		Actual		Cash Overhead			Operating		
		Hours	Capital	Insur-			Fuel &	Total	Total
Yr	Description	Used	Recovery	ance	Taxes	Repairs	Lube	Oper.	Costs/Hr.
04	130 HP 2WD Tractor	1,200.00	3.60	0.14	0.20	2.84	12.58	15.42	19.36
04	280 HP Crawler	1,600.10	7.77	0.30	0.44	4.67	27.10	31.77	40.28
04	92 HP 2WD Tractor	1,200.10	2.29	0.09	0.13	1.81	7.53	9.34	11.84
04	Bed Shaper 4 Row 13'	166.10	1.87	0.06	0.09	0.93	0.00	0.93	2.96
04	Chisel - Heavy 16'	165.70	3.80	0.13	0.19	1.94	0.00	1.94	6.07
04	Cultivate Rolling 13'	200.30	3.08	0.10	0.15	1.69	0.00	1.69	5.01
04	Cultivator 4 Row 13'	200.60	0.93	0.03	0.04	0.51	0.00	0.51	1.51
04	Disc - Finish 21'	166.20	7.97	0.27	0.40	3.11	0.00	3.11	11.76
04	Fertilizer Rig - Gandy 4 Row 13'	120.00	1.87	0.06	0.09	1.16	0.00	1.16	3.18
04	Mower-Flail 13'	200.30	4.74	0.15	0.22	5.27	0.00	5.27	10.39
04	Pickup 1/2 Ton	285.10	9.41	0.29	0.43	1.81	9.01	10.82	20.95
04	Planter Grain Drill 15’	99.40	10.91	0.40	0.60	4.55	0.00	4.55	16.46
04	Planter Jr 1Bed 2 Row 3'	149.40	0.55	0.02	0.03	0.29	0.00	0.29	0.89
04	Planter/Sled/Precision 4 Row	150.20	8.69	0.28	0.41	4.70	0.00	4.70	14.08
04	Ringroller - 21'	200.10	1.56	0.05	0.07	0.47	0.00	0.47	2.16
04	Roller - Flat 16'	166.10	0.94	0.03	0.05	0.26	0.00	0.26	1.27
04	Subsoiler - 8'	200.10	2.98	0.10	0.14	1.81	0.00	1.81	5.03
04	Tape Laying Machine 4 Row 13'	125.00	0.63	0.03	0.04	0.22	0.00	0.22	0.92
04	Tape Retrieval Machine 4 Row 13'	119.50	5.30	0.21	0.31	1.75	0.00	1.75	7.56
04	Triplane - 16'	250.20	5.45	0.19	0.28	3.04	0.00	3.04	8.94

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Table 7. OPERATIONS WITH EQUIPMENT – ORGANIC LEAF LETTUCE

CENTRAL COAST 2004

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 Crawler	Subsoiler 8'			
Land Prep: Disc & Roll 2X	October	280 HP Crawler	Disc Finish 21'			
			Ringroller 21'			
Land Prep: Chisel 2X	October	280 HP Crawler	Chisel 16'			
Land Prep: Landplane 2X	October	280 HP Crawler	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 Crawler	Disc Finish 21’			
Land Prep: Disc & Roll	August	280 HP Crawler	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	Hybrid 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	3.30	acin
	October			Water	6.40	acin
	November			Water	3.30	acin
Irrigate: Layout Drip & Laterals	September	92 HP 2WD	Tape Machine	Labor	3.10	hr
				Drip Tape 1/2 cost	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	48.75	lb
	October			Phytamin	48.75	lb
	October			Phytamin	48.75	lb
Land Prep: Cultivate 2X	August	130 HP 2WD	Rolling Cultivator			
	August	130 HP 2WD	Rolling Cultivator			
Weed: Cultivate & Furrow 2X	October	130 HP 2WD	Cultivator 13'			
	October	130 HP 2WD	Cultivator 13'			
Weed: Hand Hoe	October			Labor	12.00	hr
Stand Establish: Thin. Weed: Hand	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'			