
University of California Agriculture and Natural Resources
Cooperative Extension and Agricultural Issues Center
UC Davis Department of Agricultural and Resource Economics

2017

**SAMPLE COSTS TO PRODUCE AND HARVEST
BROCCOLI**



CENTRAL COAST REGION

Monterey, Santa Cruz, and San Benito Counties

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 Central Coast - Monterey, Santa Cruz, and San Benito Counties

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INTRODUCTION

The sample costs to produce and harvest broccoli in the Central Coast Region – Monterey, Santa Cruz, and San Benito 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 blank column titled “Your Cost” is provided to enter your actual costs on Tables 1 and 2.

The hypothetical farm operation, production practices, overhead, and calculations are described under assumptions. For additional information or explanation of calculations used in the study, call the Department of Agricultural and Resource Economics, University of California, Davis, (530) 752-4651, Laura Tourte, UC Cooperative Extension Santa Cruz County (831) 763-8005, Richard Smith, UC Cooperative Extension Monterey County (831) 759-7357, or your local UC Cooperative Extension office.

Sample Cost of Production studies for many commodities are available and can be downloaded from the website <https://coststudies.ucdavis.edu>. Archived studies are also available on the website.

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ASSUMPTIONS

The following assumptions refer to Tables 1 through 6 and pertain to sample costs to produce and harvest broccoli for the Central Coast Region – Monterey, Santa Cruz, and San Benito Counties. Sample costs are given for tractor, fuel, repairs, labor, materials, and custom services and are based on current figures. *Costs per acre can vary considerably depending upon many variables including individual grower, production location and weather conditions, land rent and taxes, soil type, water costs, pest pressures, material inputs, and energy costs.* For example, broccoli produced in areas with heavy clay soils may have higher land preparation costs per acre than areas with sandy soils. Areas with sandy soils, in turn, will likely have higher water use and irrigation costs per acre than areas with heavy clay soils.

The practices and costs used in this study may not be applicable to all situations or used in each production year. Individual growers may use this study as a template and modify it to more accurately reflect their own situations. Additional broccoli production information for California is available online from the University of California Division of Agriculture and Natural Resources at: <http://anrcatalog.ucanr.edu/pdf/7211.pdf>. **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. This study assumes a farm operation of 1,500 non-contiguous acres of rented land. Roads and buffer zones comprise roughly six percent of the acreage. Broccoli for the fresh market is planted on 500 acres and rotated with other cool season vegetable crops to assist with pest management and soil fertility. Broccoli is planted year round along the Central Coast. Typically, a farm can produce up to two vegetable crops per year on each field. Costs that affect both crops are allocated accordingly. Land rents for row crops range from a low of \$450 to a high of \$3,300 per acre per year in the area. For this study, an annual rental rate of \$2,700 per acre per year is assumed, with \$1,350 allocated to the broccoli crop.

Production Cultural Practices and Material Inputs

Land Preparation. Prior to land preparation, and to help determine fertilization practices, a total of 25 soil samples per 500 acres are taken for analysis. In this study, land preparation is assumed to begin in June and includes disking (four times), subsoiling (twice), land and laser leveling (once each for every 2 crops). Compost is then custom applied at the rate of four tons per acre (or two tons for each vegetable crop), the acreage chiseled (a total of four times), disced (twice), and beds listed. In July, the beds are cultivated (twice) with a rolling cultivator (Lilliston), and then shaped with a power mulcher.

Plant/Stand Establishment. Broccoli is direct-seeded using an 80-inch 4-row 3-bed precision air-planter. This study assumes that broccoli is planted to a stand in July using 69,700 seeds per acre (4.5-inch in-row spacing). A portion of the total acreage planted to broccoli along the Central Coast is transplanted rather than direct-seeded. If transplants are used, estimated costs will increase by \$800 to \$1,000 per acre than those shown in this study.

Fertilizer/Soil Amendments. At planting, an anti-crustant (7-7-0-7) is custom applied at the rate of 30 gallons per acre, which supplies 22 pounds of nitrogen (N) to the crop. The liquid fertilizer AN 20, is sidedressed three times during the growing season: 30 days after planting at 25 gallons per acre, 40 days after planting at 25 gallons per acre, and again 50 days after planting at 20 gallons per acre. These applications total 70 gallons of AN 20, which supplies 148 pounds of N to the crop. Total N use during the growing season is 170 pounds per acre. The amount of fertilizer used in this study is an average amount; fertilization practices and rates vary and depend soil type, irrigation system, amount of nitrate-N in irrigation water, and quantity of residual soil nitrate-N.

Irrigation. For this study, the estimated cost of pumped water is \$216 per acre-foot or \$18 per acre-inch. Water costs vary considerably in the area depending upon the water district or agency, delivery, associated fees, and pumping variables. Between 2 and 3 acre-inches of water per acre are applied through sprinklers three times during stand establishment. For the remainder of the growing season, between 15 and 18 acre-inches per acre are applied, also using sprinkler irrigation, for a seasonal total of between 17 and 21 acre-inches per acre. Labor costs include time to set up and monitor the sprinkler system for proper function. Total water use will vary depending upon factors such as irrigation method, soil type, weather, and the time of the year the crop is planted.

Pest Management. Information for specific pest management materials and the associated application rates can be found in the *UC Integrated Pest Management (IPM) Guidelines for Cole Crops*. For more information on pest identification, monitoring, and pest management materials, visit the UC IPM website at: <http://www.ipm.ucdavis.edu/PMG/crops-agriculture.html>. Written recommendations are required for many commercially applied pesticides and are made by licensed pest control advisers. For information and pesticide use permits, contact your local county Agricultural Commissioner's office.

Pest Control Adviser/Certified Crop Adviser (PCA/CCA). A PCA/CCA monitors the field for insects, diseases, irrigation, nutrition, and other production needs to determine the necessary management practices. The cost for a PCA in this study is \$30 per acre.

Weeds. At planting the herbicide Dacthal is banded (applied to 25 percent of the area). Broccoli is mechanically cultivated three times: once 45 days after planting, with two additional cultivations spaced 10 days apart. Fields are hand weeded once after the last cultivation. An alternative weed control method, but not included in this study, is a directed spray of AN 20 at 35 gallons per acre.

Insects/Diseases. Fields are monitored for a variety of insect pests including aphids, cabbage maggot, bagrada bug, and miscellaneous lepidopterous pests. Three to four pest management applications are typically used during the growing season. Disease problems are minimal in broccoli; growers do not typically apply fungicides because of this. If disease issues do arise growers may use one or two fungicide applications to manage pests. Because of the variation in insect and disease pressures from year to year and location to location, costs for a generic pest management program are included in this study.

Harvest. Broccoli is hand harvested and field packed at crop maturity as bunches or crowns. It may also be harvested as florets or for slaw. The same field may be harvested multiple times for a mix of different packed

products and markets. The exact timing depends on the variety and time of year planted. Cool season plantings may require up to 120 days to mature, but as the season warms, time to maturity decreases. For this study, a harvest and field packing cost of \$6.00 per 21-pound 14-bunch carton is assumed. Transportation costs vary depending on the distance to market and are included in the above costs. Cooling and palletizing costs an additional \$1.00 per carton, which brings the total harvest cost to \$7.00 per carton. In addition, a sales and marketing cost of \$0.75 per carton is included in this study; this cost may vary from grower to grower.

Yield. Yield is estimated to range from 550 to 850 cartons per acre, with 700 21-pound 14-bunch cartons the representative yield used in this study. The pack is only one of several different types that may be used for broccoli. Actual yield per acre depends upon many variables, including production location, season produced, field conditions, and pack type and weight.

Returns. Price for broccoli is estimated to range from \$8.00 to \$13.00 per 21-pound bunch carton with a representative price of \$10.55 per carton in this study. This range reflects the Salinas-Watsonville 2012-2016 shipping point monthly averages of the USDA Agricultural Marketing Service. Table 4 provides more information on yield and price ranges, including sample net returns above indicated costs.

Growing Costs. Some growers along the Central Coast of California prefer to focus on growing costs and therefore separate total harvest costs from total cash costs, and equipment depreciation and replacement costs. For this study, growing costs are noted at the bottom of Table 1, and are calculated by subtracting total harvest costs from total costs. Growing costs depend upon many variables including location and grower.

Labor, Interest, and Equipment

Labor. The labor rates used in this study are \$21.85 per hour for machine operators, \$17.80 for irrigators and \$16.90 for general labor, which includes overhead of 41 percent. The basic hourly wages are \$15.50 for machine operators, \$12.60 for irrigators and \$12.00 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 rate as of January 1, 2017. Labor for operations involving machinery are 20 percent 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.

In 2016 new minimum wage and overtime laws were passed in California. It is not yet clear what the overall impact of the laws will be on prevailing agricultural wages, therefore agricultural labor costs are currently in flux and may differ substantially from those shown in this study. Growers may already pay wages that are higher than the state's requirement as is shown in this study for 2017. Tables A and B show the phase-in schedules for the new laws.

Table A. Minimum Wage Phase-In Schedule, 2016 to 2022[†]

Year	California Minimum Wage	Minimum Wage Increase (%)
2017	10.50	5.0 [‡]
2018	11.00	4.8
2019	12.00	9.0
2020	13.00	8.3
2021	14.00	7.7
2022	15.00	7.1

[†] For employers with 26 or more employees.

[‡] Percent increase from 2016 to 2017.

Table B. Overtime Phase-In Schedule, 2016 to 2022[†]

Year	California Overtime Phase-In Hours Per Week	Overtime Hours/Week [‡]
2017	60	na
2018	60	na
2019	55	5
2020	50	10
2021	45	15
2022	40	20

[†] For employers with 26 or more employees.

[‡] Assuming a 60-hour work week and no other adjustments.

The new overtime law will gradually decrease the number of hours employees can work on a daily and weekly basis before overtime wages are required. Prior to its passage field workers and equipment operators could work up to 10 hours per day or 60 hours per week without overtime wages; by 2022 the requirement will be lowered to 8 hours per day or 40 hours per week for employers with 26 or more employees. The new overtime law may change wages and scheduling of work in complicated ways as it is phased in.

Growers may also choose to use a farm labor contractor or the H-2A guestworker visa program to employ workers. When using either one of these two approaches, base rates, overhead and compliance with housing, meals, transportation, and other requirements will vary. Use of these services may result in labor costs that are higher than those shown in this study but may be necessary in order to assure a reliable supply of labor.

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 4.50 percent 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. The rate will vary depending upon various factors, but the rate in this study is considered a typical lending rate by a farm lending agency as of April 2017.

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 and Biological Engineers (ASABE). Fuel and lubrication costs are also determined by ASABE equations based on maximum power takeoff (PTO) horsepower, and fuel type. Prices for on-farm delivery of red dye diesel and gasoline are \$2.70 (excludes excise taxes) and \$3.25 per gallon, respectively. The cost includes a 2 percent local sales tax on diesel fuel and 8 percent sales tax on gasoline. Gasoline costs also include federal and state excise taxes, which are refundable for on-farm use when filing income taxes. 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 percent higher than implement time for a given operation to account for setup, travel, and down time.

Pickup Truck. This study includes a cost for use of a pickup truck for business purposes.

Risk. The risks associated with producing and marketing a broccoli crop are considered high. While this study makes every effort to model a production system based on typical, real world practices, it cannot fully represent the production, financial, market, legal, and human resource risks that ultimately affect the profitability and economic viability of fresh market vegetable production. Crop insurance is a risk management tool that growers may use to protect against production related crop loss. Labor availability, scheduling and cost is a noteworthy human resource risk. In recent years labor constraints have meant challenges in securing and retaining a sufficient number of workers to ensure timely and effective farm operations. Some growers report paying higher wages to attract and retain workers; others may pay overtime because of labor constraints. Still others employ H-2A workers or hire labor through farm labor contractors. The market for fresh vegetables is volatile for both price and quantity. A market channel should be determined before any broccoli 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. In most cases costs are apportioned based on the number of crops produced per acre per year.

Property Taxes. Counties charge a base property tax rate of 1 percent 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 percent 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 upon the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.846 percent of the average value of the assets over their useful life. Liability insurance covers accidents and other potential farm related liabilities and costs \$20 per acre for each crop.

Office Expense. Annual office and business expenses are estimated at \$700 per acre. Because two crops are produced per acre each year, half of that cost, or \$350 is assumed for the broccoli crop studied here. Costs include, but are not limited to, a variety of administration and office expenses, a ranch supervisor, telephones, supplies, utilities, bookkeeping, and accounting. Some growers have one or more additional sub-foremen for various aspects of their operations. Costs for additional foremen are not included here.

Land Rent. Land rents in Monterey, Santa Cruz, and San Benito Counties range from \$450 to \$3,300 per acre per year. In this study land rent is assumed to be \$2,700 per acre per year or \$1,350 for the broccoli crop. However, rents vary substantially in the area. Land rent includes developed wells and irrigation system. In general, growers in the region are responsible for the portion above ground such as the pump, and the landowner is responsible for what is below ground, such as the well running dry.

Food Safety and Regulatory Programs. To ensure the safety of fresh products, accommodate buyer requests, and comply with regulatory programs such as those for water and air quality, growers now have in-house departments and/or staff specially dedicated to supervision and management of these programs. Part of a food

safety program is participation in third party (independent) audits. Costs associated with food safety programs vary depending upon the farm and inspection circumstances and are estimated at \$80 per acre per year or \$40 per acre per crop in this study. In addition, a cost of \$80 per acre per year or \$40 per acre per crop is included for management and compliance with regulatory programs.

Management 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 for the farm provide portable toilets and washbasins to the farm. The cost includes two double toilets with washbasins, delivery and pickup, and 12 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.

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

Non-Cash Overhead

Capital Recovery Costs. Capital recovery cost is the annual depreciation and interest costs for a capital investment. It is the amount of money required each year to recover the difference between the purchase price and salvage value (unrecovered capital). It is equivalent to the annual payment on a loan for the investment with the down payment equal to the discounted salvage value. This is a more complex method of calculating ownership costs than straight-line depreciation and opportunity costs, but more accurately represents the annual costs of ownership, because it takes the time value of money into account (Boehlje and Eidman). The 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 and Biological Engineers (ASABE) based on equipment type and years of life. The life in years is estimated by dividing the wear out life, as given by ASABE, 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. An interest rate of 5.00 percent is used to calculate capital recovery. The rate will vary depending upon loan amount and other lending agency conditions, but is the basic suggested rate by a farm lending agency as of January 2017.

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 inventory.

Fuel Tanks. Two 1,000-gallon fuel tanks, one for diesel and one for gasoline are set up in a cement containment pad that meets federal, state, and county regulations.

Irrigation System/Trailers. The irrigation system is maintained by the landowner and assumed to be included in the land rental cost. The grower invests in and owns sprinkler pipe sufficient for irrigation needs. The grower also owns trailers and equipment needed for moving pipe and other irrigation supplies to and from 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 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 when it is both new and used. This study shows the current purchase price for new equipment, which is then adjusted to 70 percent to reflect a mix of new and used equipment. Seventy percent indicates a relatively high percentage of new equipment because of machinery upgrades that are currently necessary to meet air quality requirements. 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.

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UC COOPERATIVE EXTENSION-AGRICULTURAL ISSUES CENTER
TABLE 1. COSTS PER ACRE TO PRODUCE AND HARVEST BROCCOLI
 Central Coast-2017

Operation	Operation	Cash and Labor Costs per Acre						Total Cost	Your Cost
	Time (Hrs/A)	Labor Cost*	Fuel	Lube & Repairs	Material Cost	Custom/Rent			
Cultural:									
Soil Samples (25 per 500 Ac)	0.00	0	0	0	0	8	8		
Subsoil- 2X	1.03	27	36	30	0	0	93		
Disc & Roll 4X	0.47	12	17	15	0	0	44		
Land plane (1X per 2 Crops)	0.18	5	6	4	0	0	16		
Laser Level (1X per 2 Crops)	0.00	0	0	0	0	83	83		
Compost Spread (1X per Crops)	0.00	0	0	0	110	20	130		
Chisel 4X	1.42	37	50	43	0	0	131		
Disc & Roll 2X	0.24	6	8	7	0	0	22		
List Beds 3-row	0.00	0	0	0	0	23	23		
Cultivate- Lilliston 2X	0.40	10	8	7	0	0	26		
Shape Beds/Power Mulch	0.48	13	12	6	0	0	31		
Plant/Fertilize (7-7-0-7)	0.57	18	15	18	549	0	600		
Herbicide Application	0.00	0	0	0	35	0	35		
Irrigate - Sprinkler - Establish	2.25	40	0	0	54	0	94		
Disease/Insect Management	0.00	0	0	0	300	80	380		
Fertilize- Sidedress 3X	0.85	22	22	11	98	0	153		
Cultivate/Break Bottoms	0.95	25	20	15	0	0	60		
Irrigate- Sprinkler - Season	6.00	107	0	0	306	0	413		
Hand Weed	8.90	150	0	0	0	0	150		
Pickup use	0.23	6	2	1	0	0	9		
PCA/CCA Fee	0.00	0	0	0	0	30	30		
TOTAL CULTURAL COSTS	23.97	480	198	158	1,452	244	2,531		
Harvest:									
Harvest/Field Pack	0.00	0	0	0	0	4,200	4,200		
Cool/Palletize	0.00	0	0	0	0	700	700		
Market/Sales Fee	0.00	0	0	0	0	525	525		
TOTAL HARVEST COSTS	0.00	0	0	0	0	5,425	5,425		
Interest on Operating Capital at 4.50%							63		
TOTAL OPERATING COSTS/ACRE		480	198	158	1,452	5,669	8,019		

* A discussion about new labor laws and costs are included on pages 5 and 6 of this study; labor costs may vary substantially from those shown in here.

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TABLE 1. CONTINUED

Central Coast-2017

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per Acre					Total Cost	Your Cost
		Labor Cost	Fuel	Lube & Repairs	Material Cost	Custom/ Rent		
CASH OVERHEAD:								
Field Sanitation							12	
Land Rent							1,350	
Liability Insurance							20	
Office Expense							350	
Food Safety Program							40	
Regulatory Program							40	
Property Taxes							14	
Property Insurance							1	
Investment Repairs							31	
TOTAL CASH OVERHEAD COSTS/ACRE							1,859	
TOTAL CASH COSTS/ACRE							9,878	
NON-CASH OVERHEAD:								
		Per Producing Acre		Annual Cost Capital Recovery				
Fuel Tanks-Overhead		7		1			1	
Shop Building- 2400 sq. ft.		48		3			3	
Shop Tools		9		1			1	
Sprinkler System		370		24			24	
Sprinkler Pipe		1,139		74			74	
Equipment		1,118		155			155	
TOTAL NON-CASH OVERHEAD COSTS		2,692		257			257	
TOTAL COSTS/ACRE							10,135	

TOTAL COSTS PER ACRE – HARVEST COSTS PER ACRE = GROWING COSTS PER ACRE
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\$10,135 - 5,425 = \$4,710

UC COOPERATIVE EXTENSION-AGRICULTURAL ISSUES CENTER
TABLE 2. MATERIAL AND INPUT COSTS PER ACRE TO PRODUCE AND HARVEST BROCCOLI
 Central Coast-2017

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Broccoli	700	carton	10.55	7,385	
TOTAL GROSS RETURNS				7,385	
OPERATING COSTS					
Fertilizer:				269	
Compost	2.00	ton	55.00	110	
7-7-0-7	30.00	gal	2.03	61	
AN 20	148.00	lb N	0.67	98	
Custom:				5,669	
Soil Sample	1.00	acre	8.00	8	
Laser Level	0.50	acre	165.00	83	
Haul/Spread Compost	1.00	acre	20.00	20	
List beds 3-row 80"	1.00	acre	23.00	23	
Pesticide Application	4.00	acre	20.00	80	
Harvest/Field Pack	700.00	box	6.00	4,200	
Cool/Palletize	700.00	box	1.00	700	
Market/Sales Fee	700.00	box	0.75	525	
PCA/CCA	1.00	acre	30.00	30	
Seed:				488	
Broccoli	69.70	thou	7.00	488	
Herbicide*:				35	
Material Costs/Ac				35	
Insecticide/Fungicide*:				300	
Material Costs/Ac				300	
Water:				360	
Water - Pumped	20.00	acin	18.00	360	
Labor**				480	
Equipment Operator Labor	8.19	hrs	21.85	179	
Non-Machine Labor	9.10	hrs	16.90	154	
Irrigation Labor	8.25	hrs	17.80	147	
Machinery				356	
Fuel-Gas	0.66	gal	3.25	2	
Fuel-Diesel	72.37	gal	2.70	195	
Lube				30	
Machinery Repair				129	
Interest on Operating Capital @ 4.50%				63	
TOTAL OPERATING COSTS/ACRE				8,019	

* Pest management programs vary depending on annual production conditions and pest pressure.

** A discussion about new labor laws and costs are included on pages 5 and 6 of this study; labor costs may vary substantially from those shown in here.

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TABLE 3. MONTHLY CASH COSTS PER ACRE TO PRODUCE AND HARVEST BROCCOLI
 Central Coast-2017

	MAY 17	JUN 17	JUL 17	AUG 17	SEP 17	OCT 17	NOV 17	Total
Cultural:								
Soil Samples (25 per 500 Ac)	8							8
Subsoil- 2X		93						93
Disc & Roll 4X		44						44
Land plane (1X per 2 Crops)		16						16
Laser Level (1X per 2 Crops)		83						83
Compost Spread (1X per 2Crops)		130						130
Chisel 4X		131						131
Disc & Roll 2X		22						22
List Beds 3-row		23						23
Cultivate- Lilliston 2X			26					26
Shape Beds/Power Mulch			31					31
Plant/Fertilize (7-7-0-7)			600					600
Herbicide Application			35					35
Irrigate - Sprinkler - Establish			94					94
Disease/Insect Management			95	190	95			380
Fertilize- Sidedress 3X				107	46			153
Cultivate/Break Bottoms				20	40			60
Irrigate- Sprinkler - Season				144	144	126		413
Hand Weed					150			150
Pickup use	1	1	1	1	1	1	1	9
PCA/CCA Fee	4	4	4	4	4	4	4	30
TOTAL CULTURAL COSTS	14	547	887	481	466	131	6	2,531
Harvest:								
Harvest/Field Pack							4,200	4,200
Cool/Palletize							700	700
Market/Sales Fee							525	525
TOTAL HARVEST COSTS	0	0	0	0	0	0	5,425	5,425
Interest on Operating Capital @ 4.50%	0	2	5	7	9	9	30	63
TOTAL OPERATING COSTS/ACRE	14	549	893	489	475	141	5,460	8,019
CASH OVERHEAD								
Field Sanitation	2	2	2	2	2	2	2	12
Land Rent				1,350				1,350
Liability Insurance				20				20
Office Expense	50	50	50	50	50	50	50	350
Food Safety Program				40				40
Regulatory Program				40				40
Property Taxes				14				14
Property Insurance				1				1
Investment Repairs	4	4	4	4	4	4	4	31
TOTAL CASH OVERHEAD COSTS	56	56	56	1,522	56	56	56	1,859
TOTAL CASH COSTS/ACRE	70	605	949	2,010	531	197	5,517	9,878

UC COOPERATIVE EXTENSION-AGRICULTURAL ISSUES CENTER

TABLE 4. RANGING ANALYSIS - BROCCOLI

Central Coast-2017

COSTS PER ACRE AND PER CARTON AT VARYING YIELDS TO PRODUCE AND HARVEST BROCCOLI

	YIELD (Cartons/Acre)						
	550	600	650	700	750	800	850
OPERATING COSTS/ACRE:							
Cultural	2,531	2,531	2,531	2,531	2,531	2,531	2,531
Harvest	4,263	4,650	5,038	5,425	5,813	6,200	6,588
Interest on Operating Capital @ 4.50%	59	60	62	63	65	66	67
TOTAL OPERATING COSTS/ACRE	6,852	7,241	7,630	8,019	8,408	8,797	9,186
TOTAL OPERATING COSTS/BOX	12.46	12.07	11.74	11.46	11.21	11.00	10.81
CASH OVERHEAD COSTS/ACRE	1,859	1,859	1,859	1,859	1,859	1,859	1,859
TOTAL CASH COSTS/ACRE	8,711	9,100	9,489	9,878	10,267	10,656	11,045
TOTAL CASH COSTS/BOX	15.84	15.17	14.60	14.11	13.69	13.32	12.99
NON-CASH OVERHEAD COSTS/ACRE	257	257	257	257	257	257	257
TOTAL COSTS/ACRE	8,969	9,358	9,746	10,135	10,524	10,913	11,302
TOTAL COSTS/BOX	16.00	16.00	15.00	14.00	14.00	14.00	13.00

Net Return per Acre above Operating Costs for Broccoli

PRICE (\$/crtn)	YIELD (cartons/acre)						
Broccoli	550	600	650	700	750	800	850
8.00	-2,452	-2,441	-2,430	-2,419	-2,408	-2,397	-2,386
8.85	-1,985	-1,931	-1,878	-1,824	-1,771	-1,717	-1,664
9.70	-1,517	-1,421	-1,325	-1,229	-1,133	-1,037	-941
10.55	-1,050	-911	-773	-634	-496	-357	-219
11.40	-582	-401	-220	-39	142	323	504
12.25	-115	109	332	556	779	1,003	1,226
13.10	353	619	885	1,151	1,417	1,683	1,949

Net Return per Acre above Cash Costs for Broccoli

PRICE (\$/crtn)	YIELD (cartons/acre)						
Broccoli	550	600	650	700	750	800	850
8.00	-4,311	-4,300	-4,289	-4,278	-4,267	-4,256	-4,245
8.85	-3,844	-3,790	-3,737	-3,683	-3,629	-3,576	-3,522
9.70	-3,376	-3,280	-3,184	-3,088	-2,992	-2,896	-2,800
10.55	-2,909	-2,770	-2,632	-2,493	-2,354	-2,216	-2,077
11.40	-2,441	-2,260	-2,079	-1,898	-1,717	-1,536	-1,355
12.25	-1,974	-1,750	-1,527	-1,303	-1,079	-856	-632
13.10	-1,506	-1,240	-974	-708	-442	-176	90

Net Return per Acre above Total Costs for Broccoli

PRICE (\$/crtn)	YIELD (cartons/acre)						
Broccoli	550	600	650	700	750	800	850
8.00	-4,569	-4,558	-4,546	-4,535	-4,524	-4,513	-4,502
8.85	-4,101	-4,048	-3,994	-3,940	-3,887	-3,833	-3,780
9.70	-3,634	-3,538	-3,441	-3,345	-3,249	-3,153	-3,057
10.55	-3,166	-3,028	-2,889	-2,750	-2,612	-2,473	-2,335
11.40	-2,699	-2,518	-2,336	-2,155	-1,974	-1,793	-1,612
12.25	-2,231	-2,008	-1,784	-1,560	-1,337	-1,113	-890
13.10	-1,764	-1,498	-1,231	-965	-699	-433	-167

UC COOPERATIVE EXTENSION-AGRICULTURAL ISSUES CENTER
TABLE 5. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS FOR BROCCOLI
 Central Coast-2017

ANNUAL EQUIPMENT COSTS

Yr.	Description	Price	Years Life	Salvage Value	Capital Recovery	Cash Overhead		Total
						Insurance	Taxes	
17	Pickup Truck	17,655	7	1,766	2,689	8	97	2,794
17	205HP Crawler	350,000	8	122,146	38,075	199	2,361	40,634
17	Subsoiler - 16'	42,454	3	17,656	9,556	25	301	9,881
17	Disc - Offset 25'	48,769	4	17,950	9,113	28	334	9,475
17	Ring Roller 25'	29,000	4	10,674	5,419	17	198	5,634
17	Triplane - 16'	38,000	10	6,720	4,061	19	224	4,303
17	Chisel - Heavy 26'	51,218	2	24,069	15,245	32	376	15,653
17	120HP2WD Tractor	136,967	10	40,458	13,268	75	887	14,230
17	Lilliston-Rolling 3-Row	18,000	10	3,183	1,923	9	106	2,038
17	150HP4WD Tractor	225,000	10	66,461	21,796	123	1,457	23,376
17	Bed Shaper 3-Row	44,412	15	4,548	3,694	21	245	3,959
17	Row crop planter	54,887	5	17,879	8,925	31	364	9,320
17	Saddle Tanks - 300gal	1,660	2	780	494	1	12	507
17	Fertilizer Bar 20'	13,054	8	3,144	1,575	7	81	1,662
17	Spray Boom 20'	2,900	5	945	472	2	19	492
17	Cultivator 3-Row	9,500	4	3,497	1,775	5	65	1,846
TOTAL		1,083,476	-	341,876	138,080	601	7,127	145,808
70% of NewCost*		758,433	-	239,313	96,656	421	4,989	102,065

*Used to reflect a mix of new and used equipment

ANNUAL INVESTMENT COSTS

Description	Price	Years Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insurance	Taxes	Repairs	
INVESTMENT								
Fuel Tanks-Overhead	10,975	20	0	790	5	55	220	1,069
Shop Building-2400 sq. ft.	72,000	30	0	4,038	30	360	1,440	5,869
Shop Tools	13,072	20	1,307	896	6	72	131	1,105
Sprinkler System	370,495	20	185,247	20,278	234	2,779	7,410	30,701
Sprinkler Pipe	1,139,000	20	569,500	62,339	720	8,543	22,780	94,381
TOTAL INVESTMENT	1,605,542	-	756,054	88,340	995	11,808	31,981	133,124

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Field Sanitation	500	acre	12	6,000
Land Rent	500	acre	1,350	675,000
Liability Insurance	500	acre	20	10,000
Office Expense	500	acre	350	175,000
Food Safety Program	500	acre	40	20,000
Regulatory Programs	500	acre	40	20,000

UC COOPERATIVE EXTENSION-AGRICULTURAL ISSUES CENTER
TABLE 6. HOURLY EQUIPMENT COSTS FOR BROCCOLI
 Central Coast-2017

Yr.	Description	Broccoli	Total	Cash Overhead			Operating		Total Oper.	Total Costs/Hr.
		Hours Used	Hours Used	Capital Recovery	Insurance	Taxes	Lube & Repairs	Fuel		
17	Pickup Truck	113	290	6.50	0.02	0.23	2.80	9.48	12.28	19.03
17	205HP Crawler	1839	2000	13.33	0.07	0.83	16.01	32.12	48.13	62.36
17	Subsoiler - 16'	515	666	10.04	0.03	0.32	11.66	0.00	11.66	22.05
17	Disc - Offset 25'	354	500	12.76	0.04	0.47	9.80	0.00	9.80	23.07
17	Ring Roller 25'	354	500	7.59	0.02	0.28	3.96	0.00	3.96	11.85
17	Triplane - 16'	92	300	9.48	0.04	0.52	6.86	0.00	6.86	16.90
17	Chisel - Heavy 26'	711	1000	10.67	0.02	0.26	13.19	0.00	13.19	24.14
17	120HP2WD Tractor	743	1600	5.80	0.03	0.39	12.91	18.80	31.71	37.94
17	Lilliston-Rolling 3-Row	200	200	6.73	0.03	0.37	4.35	0.00	4.35	11.49
17	150HP4WD Tractor	1050	1600	9.54	0.05	0.64	10.63	23.50	34.13	44.36
17	Bed Shaper 3-Row	242	400	6.46	0.04	0.43	1.21	0.00	1.21	8.14
17	Row crop planter	288	300	20.83	0.07	0.85	18.60	0.00	18.60	40.35
17	Saddle Tanks - 300gal	712	750	0.46	0.00	0.01	0.54	0.00	0.54	1.01
17	Fertilizer Bar 20'	712	750	1.47	0.01	0.08	0.37	0.00	0.37	1.92
17	Spray Boom 20'	288	300	1.10	0.00	0.04	0.93	0.00	0.93	2.08
17	Cultivator 3-Row	475	500	2.49	0.01	0.09	2.34	0.00	2.34	4.93