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

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SAMPLE COSTS TO PRODUCE AND HARVEST ORGANIC STRAWBERRIES

FRESH MARKET

CENTRAL COAST REGION

Santa Cruz, Monterey, and San Benito Counties

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CONTENTS

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INTRODUCTION

Organic production, as defined by the USDA's Organic Foods Production Act of 1990, is a "production system that is managed in accordance with the Act and regulations in this part to respond to site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity."

Sample costs to produce and harvest organic strawberries in Santa Cruz, Monterey, and San Benito Counties are presented in this study. It 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 and harvest procedures considered typical for this crop and area, and will not apply to every farm. 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 in Tables 1 and 2.

The hypothetical farm operation, production and harvest practices, overhead, and calculations are described under assumptions. For additional information or explanation of calculations used in the study, contact Mark Bolda, UC Cooperative Extension Santa Cruz County, mpbolda@ucanr.edu, or Jeremy Murdock, Department of Agricultural and Resource Economics, University of California, Davis, coststudies@ucdavis.edu. 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.

ASSUMPTIONS

The following assumptions refer to Tables 1 to 6 and pertain to sample costs to produce organic strawberries in the Central Coast Region - Santa Cruz, Monterey, and San Benito Counties. **Sample costs are given for tractors, fuel, repairs, labor, materials, and custom services and are based on current figures as of May 2024. Costs per acre can vary considerably depending upon many variables such as individual grower practices vs custom services, production location and weather conditions, land rent and taxes, soil type, water costs, pest pressures, material inputs, energy costs, and labor costs and availability.** Uncertainty about climate change and the regulatory environment may also impact the costs and returns studied here.

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 strawberry production information is available from the University of California Division of Agriculture and Natural Resources at https://anrcatalog.ucanr.edu/Items.aspx?hierId=160100. **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. Organic growers should be certain that any material inputs and applications meet the regulatory requirements of state and national organic programs, and those of their accredited certifying agent(s). This includes but is not limited to regulations associated with allowed, restricted, and prohibited uses of various materials.**

Organic strawberries represent approximately 13 percent of all strawberries produced along the Central Coast. Many of the practices that are used in organic production are also used in conventional production. Differences between the two production systems are found primarily, though not exclusively, in approaches to crop fertilization and pest management. Additional details on costs and returns for conventionally produced strawberries can be found at: https://coststudies.ucdavis.edu/current/commodities/strawberries.

Farm. This study assumes a farm operation size of 30 contiguous acres of rented land. Organic strawberries are planted on 27 acres; roads, the irrigation system, and on-farm buildings account for the remaining three acres. The grower rents the land, which is assumed to be fairly flat. Organic strawberries may also be planted on rolling hills or sloped land in the area. This may necessitate erosion prevention and control measures, as well as practices and equipment that differ from those used in this study; differing practices or equipment are not included here. In this area, arrangements are often made with other farmers and owners of organically certified land to rotate strawberries with vegetable or other berry crops, in part to assist with management of soilborne diseases, weed control, and for long-term improvements to soil fertility.

Production Cultural Practices and Material Inputs

To gain certified organic status, growers must farm on land to which no synthetically formulated fertilizers and/or pesticides have been applied for a minimum of three years. 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.

Land Preparation, Pre-Plant Fertilization, and Pre-Plant Irrigation. This study assumes that a soil building cover crop is planted prior to a strawberry – vegetable two-crop rotation. Costs associated with the cover crop are therefore split between the two crops, with half the cost shown here. To help determine

fertilization practices, two soil samples per 27 acres are then taken for analysis. Strawberry ground is then subsoiled five times, disced four times, leveled, chiseled twice, and then sprinkler irrigated with 2.5 acre-inches of water to assist with soil preparation and weed management. Compost is then applied at the rate of eight tons per acre by a custom operator. Soil is also amended with rice bran at five tons per acre, feather meal (13-0-0) at one-half ton per acre, and gypsum at two tons per acre. Beds are then listed and shaped, drip irrigation is installed (two lines per bed), and beds are covered with a plastic mulch using a mulch laying implement.

Plant Establishment. A slotting implement is used to punch holes in the plastic mulch at appropriate intervals to prepare for transplanting. Several varieties such as Albion, Chandler, Monterey, San Andreas, Sweet Anne, and a number of proprietary varieties are suitable for organic production in the region, but no specific variety is assumed in this study. For this study, organic strawberries are planted on 48-inch beds, two rows per bed, at a 12-inch plant spacing, for a total of 21,780 plants per acre. Typically, seven percent of the field, or 1,525 plants per acre, is replanted in the weeks and months that follow because of poor planting and field conditions; replanting is included in the establishment costs. Labor to plant/replant is estimated at 52.5 hours per acre. Some growers use different bed widths and plant spacings; management practices may then also differ to accommodate production and harvest needs.

Post-Plant Irrigation. Immediately after planting organic strawberries are sprinkler irrigated using one acre-inch of water. From March through September (seven months), strawberries are drip irrigated two to three times per week using a total of 24 acre-inches of water over the entire growing season. Including the 3.5 acre-inches applied by sprinkler irrigation earlier in the season, a total of 27.5 acre-inches is applied to the field. Effective rainfall is not taken into account. Water cost is estimated at $360 per acre-foot or $30 per acre-inch. **The total amount and cost of water may differ substantially in this area depending on factors such as seasonal conditions, soil type, well depth and pumping variables, water district or agency, and associated delivery or other fees and taxes.**

CropManage. Growers may now take advantage of real-time recommendations for efficient water use and nitrogen fertilizer applications by using UC ANR's CropManage: https://cropmanage.ucanr.edu/. CropManage, which is currently available at no cost to growers, may be especially helpful in decision-making, accurate documentation of material inputs, sustainable practices, and compliance with both state and regional regulatory programs (see Fertilizer and Irrigation Regulatory Programs section below). Commercially available software programs may also be used.

Post-Plant Fertilization. From February to September (eight months), the grower applies a series of foliar sprays, including Biomin Calcium (2-0-0-7, a calcium supplement) and Maxi Crop Seaweed Extract, once per month at a rate of one gallon per acre and 2.5 pounds per acre, per application, respectively. These materials are used to ensure that a balance of N, P, K and micronutrients are supplied to the plants.

Beginning in March and continuing through September, liquid fertilizers are applied to the soil through the drip irrigation system. Agrothrive LF (4-1-1), a fish emulsion, and True Organics 4-2-2 are applied every week at a rate of ten and five gallons per acre respectively, per application for a total of 16 applications. Fertilization materials and rates will vary substantially by grower and year depending on soil tests and plant needs.

Pest Management. Information for specific pest management materials and the associated application rates can be found in the *UC Integrated Pest Management (IPM) Pest Management Guidelines for Strawberries*. For more information on pest identification, monitoring, and pest management materials visit

the UC IPM website at: https://ipm.ucanr.edu/agriculture/strawberry/ or contact your local UCCE farm advisor. 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. Before any pesticides are applied it is important to verify that the materials are allowed for use by national and state organic programs and the farmer's USDA accredited certifying agent.

Pest Control Adviser (PCA). A PCA monitors the field for pest problems and nutritional status. Growers may hire private consultants on a per acre basis or as part of an agreement with an agricultural chemical and fertilizer company. In this study cost for a PCA is included at an estimated cost of $140 per acre.

Weeds and Runners. Weed management is especially challenging for organic strawberry production because soil fumigation and most herbicides are not allowed under organic regulations. For 10 months beginning in December and ending in September, weeds and runners are managed by hand. Hand weeding is estimated at 22 hours per acre per month for 10 months during the production season, and runner removal is estimated at 12.5 hours per acre per month for the same 10 months during the production season. The field is also cultivated three times during the season. Growers with different planting configurations and/or especially weedy fields may require a higher level of management and therefore higher costs.

Vertebrates. Rodents, such as pocket gophers (*Thomomys spp*.), cause damage in strawberry fields by feeding on the plant roots, digging tunnels into the beds and also gnawing holes in the drip irrigation tape. They may be controlled in organic strawberry fields by trapping and other means throughout the growing season. Total cost per acre is estimated at $134, which includes the cost of traps and labor.

Insects and mites. Pests common to strawberries in this area include lygus bug *(Lygus hesperus),* leafrollers (family Tortricidae), twospotted spider mite *(Tetranychus urticae),* Lewis mite *(Eotetranychus lewisi),* Western flower thrips *(Frankliniella occidentalis),* vinegar flies *(Drosophila* spp.*)*, and certain species of aphids and other Lepidopterous pests.

Lygus bug is considered to be one of the most challenging pests to manage in organic strawberry production. To assist with management of lygus bugs, current grower practice is use of a bug vacuum twice per week beginning in April and ending in October (or end of the season).

To assist with the control of two-spotted spider mite, the predatory mite (*Phytoseiulis persimilis*) is released five times, twice in February, twice in March, and once in April for a total application rate of 100,000 mites per acre per year. Application time is estimated at one hour per acre per release. Lewis mite is controlled using two sprays of the wetting agent Vestis in the early part of the season. Lepidopterous pests (worms) are managed using four applications of Dipel (*Bacillus thuringiensis* [Bt]), applied at a rate of one pound per acre per application in May and June. Entrust may be used for management of vinegar flies, including spotted wing drosophila, up to three times per season but is not included here.

Diseases. Powdery mildew (*Podosphaera aphanis*) and Botrytis fruit rot (*Botrytis cinerea*) are the two foliar and fruit diseases most common to strawberries in this area. Micronized sulfur (Kumulus) is applied for powdery mildew control at the rate of five pounds per acre per application, every three weeks, beginning in late March and ending in early October, for a total of nine applications per year. Because no organically acceptable fungicide has proven consistently effective for Botrytis fruit rot, the associated disease pressure is minimized by culling diseased fruit by hand during harvest. It is assumed to be included in harvest costs.

Harvest. The crop is harvested from April through early October, with peak harvest in June, July, and August as shown in Table A. Organic strawberries are harvested by hand and field sorted/packed into eight 1-pound clamshell containers per tray at an average seasonal cost of $5.00 per tray. The tray/clamshell cost is estimated at $1.90 per unit. Other container types and sizes are used but are not included in this study. Harvest is managed by a foreman, who supervises one or more 35-person crews depending upon seasonal production, yield, and labor availability. Harvest rate per person ranges from three to eight trays per hour, with the lower rate occurring early and later in the season. Harvest also includes a fruit checker and a card puncher to ensure proper harvest and tray counts are recorded for each member of the crew. A truck loader stacks harvested trays on flatbed trucks and drivers deliver organic strawberries to the cooler, which takes about one hour roundtrip. Each truck holds two to three pallets with 110 trays per pallet or 220 to 330 trays per load. Cooling cost varies by cooler and grower volume and in this study is estimated at $1.00 per tray.

Table A. Percent Crop Harvested by Month

	April	May	June	July	Aug	Sept	Oct
Harvest %	5	12	25	25	18	12	3

Yields and Returns. Organic strawberry yield is measured in trays per acre. Average yield for fresh market fruit ranges from 6,000 to 8,000 trays per acre, depending on seasonal growing conditions. This study assumes a yield of 7,000 trays containing eight 1-pound clamshells per acre. The weight ranges from 9.0 to 9.3 pounds per tray to account for some variance in fruit weight per tray and the weight of the clamshells and trays. Some varieties may produce higher yields than those shown in this study.

The estimated unit price to growers for organic strawberries is $16 per tray and is based on the 2021 to 2023 Salinas-Watsonville shipping point prices from the USDA Agricultural Marketing Service. Prices range from a low of $11 to a high of $23 depending on market conditions. In general higher prices are seen early and late in the season when the volume of harvested product is low; lower prices are seen when peak season volumes are high. Estimated net returns to growers for a combination of yields and prices are shown in Table 4 Ranging Analysis.

Sales/Marketing. Selling costs for fresh market fruit are estimated at eight percent of the selling price or $1.28 per tray ($16 x 8%), which is shown on Tables 1 to 3.

California Strawberry Commission (CSC) Assessments. Growers and shippers pay the CSC an assessment per tray (eight 1-pound containers) for research and marketing activities. The current assessment is $0.05 per tray, which is split equally between the grower and shipper. Grower cost is therefore estimated at $0.025 per tray.

Post-Harvest (Year End) Cleanup. After all harvest operations have been completed, organic strawberry plants are mowed, the plastic mulch and drip tape are removed, and disposed of at a landfill or recycling center. In this study a custom operator performs this service; it may also be handled by growers using their own equipment and labor. Growers may also have a crew walk the field to make sure all mulch has been removed from the field. The field is disced twice in preparation for the next crop.

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, 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 in this region vary considerably and depend on grower specific production practices, water and other input costs, and land rent and taxes.**

Labor, Equipment, and Interest

Labor. Labor rates are $29.60 per hour for machine operators and $24.42 for field labor, which includes overhead of 48 percent. The basic hourly wages are $20.00 for machine operators and $16.50 for field labor. The overhead includes the employers' share of federal and California state payroll taxes, workers' compensation insurance for strawberry crops (code 0079), and a percentage of other possible benefits. Workers' compensation costs will vary among growers, but for this study the cost is based upon the average industry rate as of September 2023. Labor 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.

California Minimum Wage and Overtime Rules. In 2016 new minimum wage and overtime laws were passed in California that were gradually phased in over time. For 2024 minimum wage increased to $16.00 per hour, a 3.2 percent increase over the 2023 minimum wage. Many growers may already pay wages that are higher than the state's legal requirement, as is shown in this study. In 2022 the new overtime law completed its multi-year phase in period for farming operations that employ 26 or more employees. Overtime wages are now required for work over 8 hours per day or 40 hours per week.

Federal H-2A Program. Growers may choose to use the H-2A guestworker visa program to employ workers. Rates of pay are determined by the highest applicable wage rates that are in effect at the time work is performed: the adverse effect wage rate (AEWR), the applicable prevailing wage, the agreed-upon collective bargaining rate, or the Federal or State statutory minimum wage (US Department of Labor). Growers also need to comply with other requirements associated with the H-2A program, including those for housing, meals, and transportation. Use of this program 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 9.0 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 February 2024.

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 $5.18 (excludes excise taxes) and $4.60 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/ATV. This study includes costs for the use of a pickup truck and ATV for business purposes.

Risk. The risks associated with producing and marketing fresh market organic strawberries are considered high. While this study makes every effort to model a production system based on typical, real world practices, it cannot fully represent financial, production, market, legal, and human resource risks that

ultimately affect the profitability and economic viability of fresh market strawberries. Crop insurance is one tool that growers may use to protect against loss but is not included in this study. The market for fresh market organic strawberries is volatile for both price and quantity. A market channel should be determined before 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.

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 on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.710 percent of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and each year is estimated at $567 for the entire farm.

Office Expenses. Annual office and business expenses are estimated at $800 per acre. Costs include, but are not limited to, a variety of administration and office expenses such as office supplies, telephones, bookkeeping, accounting, road maintenance, utilities, and other miscellaneous expenses.

Land Rent. Land rents in the three-county area range from $500 to $4,000 per acre per year. In this study land rent is assumed to be $3,200 per acre per year. Land rent includes developed well(s) and irrigation system. In general, growers 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.

Organic Certification and Registration Fees. Certification and registration fees for organic strawberries are estimated at $360 per acre. This includes fees associated with gross sales, travel and inspection, and certification by a USDA accredited certifying agent and the California Department of Food and Agriculture's Organic Program. Fees will vary from year to year depending upon inspection requirements and product sales.

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 nutrient management, growers may have in-house departments or staff specially dedicated to the supervision and management of these programs. **Associated costs will vary depending upon the farm size, staff time, and the complexity of operations.**

Food Safety. An estimated cost of $112 per acre is included in this study. It includes participation in a third party (independent) audit of food safety practices.

Fertilizer and Irrigation Regulatory Programs. This study includes a cost of $95 per acre for compliance and fees associated with current water quality and nutrient management regulatory programs: the State's Sustainable Groundwater Management Act (SGMA) and the Central Coast's Irrigated Lands Regulatory Program (ILRP). The estimated costs are for staff time to assist with sampling, data collection,

recordkeeping, reporting, and administration. Fees associated with both SGMA's local Groundwater Sustainability Agency (GSA) and participation in a third-party entity to comply with ILRP's Central Coast (Region 3) Agricultural Order (Ag Order 4.0) are also estimated and included in the cost.

Field Sanitation. Sanitation services for the farm provide portable toilets with washing stations to the farm at an estimated cost of $45 per acre. The cost includes double toilets with washbasins, delivery and pickup, and 12 months of servicing. Costs also include soap or other suitable cleaning agents, and single-use towels. Separate potable water and single-use drinking cups are also supplied.

Ranch Supervisor. The grower hires a supervisor to oversee some of the farm operations and work as needed when additional assistance is needed for cultural or harvest operations. The estimated cost for a supervisor is $1,500 per acre. Larger operations may have multiple supervisory or management levels; associated costs will therefore differ.

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, with the exception of drip system repairs, which are 5 percent of the total costs and include materials and labor.

Non-Cash Overhead

Non-cash overhead, shown on an annual per acre basis, 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). 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 formula for the calculation of 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 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 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 8.25 percent is used to calculate capital recovery. The rate will vary depending upon size of loan and other lending agency conditions but is the basic suggested rate by a farm lending agency as of February 2024.

Buildings and Tools. Estimated costs for a metal building, shop, and hand tools are included in the study. The value is estimated and does not represent any specific inventory.

Fuel Tanks. Two fuel tanks, one for diesel and one for gasoline, are located on the property. The tanks are set up in a cement containment pad that meets federal, state, and county regulations.

Irrigation System. The irrigation system is maintained by the landowner and assumed to be included in the land rental cost. In some cases the grower may be responsible for maintenance. The grower invests in and owns sprinkler pipe and drip system materials sufficient for irrigation needs. The grower also owns a trailer and other equipment needed for moving pipe and irrigation supplies to and from the field. Irrigation water is pumped from a well and delivered to the field through an underground pipe system.

Main lines above ground are connected to the underground system to deliver water for irrigation. Additional information about irrigation practices is located in the Production Cultural Practices and Material Inputs section.

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 70 percent to indicate 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 – UC DAVIS AGRICULTURAL AND RESOURCE ECONOMICS

TABLE 1. COSTS PER ACRE TO PRODUCE AND HARVEST ORGANIC STRAWBERRIES

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:								
Cover Crop (1 per 2 Crops)	0.00	0	0	0	0	75	75	
Soil Samples (2 per 27 Acres)	0.00	0	0	0	0	5	5	
Subsoil 5X	3.75	133	94	35	0	0	263	
Disc 4X	0.93	33	23	10	0	0	66	
Level (Landplane)	1.00	36	25	10	0	0	71	
Chisel 2X	0.60	21	13	6	0	0	40	
Sprinkler Irrigation 2X (Pre/Post Plant)	1.30	78	20	8	105	0	211	
Compost Application	0.00	0	0	0	440	240	680	
Rice/Feather/Gypsum Application	0.00	0	0	0	2,965	30	2,995	
List / Shape 48" Beds	0.50	18	13	4	0	0	34	
Install Drip Tape/System	2.00	120	31	14	1,394	0	1,559	
Open Trench for Drip	0.10	16	2	1	0	0	18	
Grade Field Roads 2X	0.58	21	9	4	0	0	33	
Lay Mulch	2.00	266	31	18	516	0	831	
Punch Holes	1.50	53	18	6	0	0	77	
Plant (Includes 7% Replant)	52.50	1,282	0	0	4,661	0	5,943	
Roll Plants to Pack	0.20	7	2	1	0	0	10	
Hand Weed	220.00	5,372	0	0	0	0	5,372	
Runner Removal	125.00	3,053	0	0	0	0	3,053	
Release Persimilis (Predatory Mites)	5.00	122	0	0	850	0	972	
Mite Control (Vestis)	0.20	7	4	2	12	0	25	
Cultivate 3X	0.75	27	16	7	0	0	50	
Foliar Fertilize (Biomin/MaxiCrop)	0.78	28	16	7	386	0	437	
Trap Vertebrates 5X	4.00	98	0	0	36	0	134	
Drip Irrigate (Season)	10.50	256	0	0	720	0	976	
Fertigate (Agrothrive/4-2-2)	4.00	98	0	0	1,164	0	1,262	
Lygus Bug Control (Vacuum)	23.73	843	365	143	0	0	1,351	
Powdery Mildew Control (Sulfur)	0.88	31	18	8	98	0	156	
Worm Control (Dipel)	0.20	7	4	2	80	0	93	
Year End Cleanup	0.00	0	0	0	0	560	560	
Disc 2X	0.46	16	12	5	0	0	33	
PCA	0.00	0	0	0	0	140	140	
Pickup Truck Use	1.71	61	20	9	0	0	89	
ATV	0.59	21	2	1	0	0	24	
TOTAL CULTURAL COSTS	464.75	12,123	737	299	13,426	1,050	27,636	
Harvest:								
Harvest Organic Strawberries	32.50	794	0	0	13,300	35,000	49,094	
Load/Haul	5.25	335	111	53	0	0	499	
Cool	0.00	0	0	0	0	7,000	7,000	
Assessments - CSC	0.00	0	0	0	175	0	175	
Market/Sales Fee	0.00	0	0	0	0	8,960	8,960	
TOTAL HARVEST COSTS	37.75	1,129	111	53	13,475	50,960	65,727	
Interest on Operating Capital at 9.00%							2,458	
TOTAL OPERATING COSTS/ACRE	503	13,252	848	352	26,901	52,010	95,822	

TABLE 1. CONTINUED

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per Acre: Labor Cost	Fuel	Lube &Repairs	Material Cost	Custom/ Rent	Total Cost	Your Cost
CASH OVERHEAD:								
Office Expense							800	
Land Rent							3,200	
Food Safety							112	
Liability Insurance							19	
Field Sanitation							45	
Water & Nutrient Management Programs							95	
Organic Certification/Registration							360	
Ranch Supervisor							1,500	
Property Taxes							56	
Property Insurance							4	
Investment Repairs							138	
TOTAL CASH OVERHEAD COSTS/ACRE							6,330	
TOTAL CASH COSTS/ACRE							102,152	
NON-CASH OVERHEAD:		Per Producing Acre		Annual Cost Capital Recovery				
Buildings		1,770		161			161	
Fuel Tanks		395		40			40	
Shop/Hand Tools		620		72			72	
Harvest Carts		38		9			9	
Lateral Lines		216		54			54	
Sprinkler Pipe		1,424		133			133	
Equipment		5,240		824			824	
TOTAL NON-CASH OVERHEAD COSTS		9,703		1,294			1,294	
TOTAL COSTS/ACRE							103,445	

Growing Costs = Total Cost – Harvest Cost. $103,445 - $65,727 = $37,718

UC COOPERATIVE EXTENSION – UC DAVIS AGRICULTURAL AND RESOURCE ECONOMICS

TABLE 2. COSTS AND RETURNS PER ACRE TO PRODUCE AND HARVEST ORGANIC STRAWBERRIES

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Organic Strawberries	7,000	tray	16.00	112,000	
TOTAL GROSS RETURNS	7,000	tray		112,000	
OPERATING COSTS					
Insecticide:				**942**	
Persimilis (Mite)	100.00	thou	8.50	850	
Vestis	13.00	floz	0.90	12	
Dipel DF (Bt)	4.00	lb	20.00	80	
Fungicide:				**98**	
Kumulus DF	45.00	lb	2.18	98	
Fertilizer:				**4,955**	
Compost	8.00	ton	55.00	440	
Feather Meal (13-0-0)	0.50	ton	1362.00	681	
Rice Bran	5.00	ton	416.00	2,080	
Gypsum	2.00	ton	102.00	204	
Biomin Calcium	8.00	gal	19.80	158	
Maxi-Crop	20.00	lb	11.36	227	
Agrothrive LF	160.00	gal	5.05	808	
True Organics 4-2-2	80.00	gal	4.45	356	
Custom:				**35,910**	
Cover Crop	0.50	acre	150.00	75	
Soil Analysis	0.07	each	84.00	5	
Spread Compost	8.00	acre	30.00	240	
Rice/Feather/Gypsum Application	1.00	acre	30.00	30	
Harvest/Sort/Pack	7000.00	tray	5.00	35,000	
Year End Cleanup	1.00	acre	560.00	560	
Materials:				**15,246**	
Drip Tape	17424.00	foot	0.08	1,394	
Mulch 48"	10890.00	foot	0.04	436	
Mulch Pins	4000.00	each	0.02	80	
Vertebrate Control Traps	4.00	each	9.00	36	
Trays/Clamshells	7000.00	each	1.90	13,300	
Water:				**825**	
Water - Central Coast	27.50	acin	30.00	825	
Plants:				**4,661**	
Strawberry Plants	23305.00	each	0.20	4,661	
Contract:				**16,100**	
Cool	7000.00	tray	1.00	7,000	
Market/Sales Fee	7000.00	tray	1.28	8,960	
PCA	1.00	acre	140.00	140	
Assessments:				**175**	
Strawberry Commission	7000.00	tray	0.03	175	
Labor				**13,252**	
Equipment Operator Labor	58.80	hrs	29.60	1,741	
Irrigation Labor	11.80	hrs	24.42	288	
Non-Machine Labor	454.75	hrs	24.42	11,105	
Equipment Operator Labor	4.00	hrs	29.60	118	
Machinery				**1,200**	
Fuel-Gas	28.73	gal	4.60	132	
Fuel-Diesel	138.19	gal	5.18	716	
Lube				127	
Machinery Repair				225	
Interest on Operating Capital @ 9.00%				2,458	
TOTAL OPERATING COSTS/ACRE				95,822	
TOTAL OPERATING COSTS/TRAY				14	
NET RETURNS ABOVE OPERATING COSTS				16,178	

TABLE 2. CONTINUED

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
CASH OVERHEAD COSTS					
Office Expense				800	
Land Rent				3,200	
Food Safety				112	
Liability Insurance				19	
Field Sanitation				45	
Water & Nutrient Management Programs				95	
Organic Certification/Registration				360	
Ranch Supervisor				1,500	
Property Taxes				56	
Property Insurance				4	
Investment Repairs				138	
TOTAL CASH OVERHEAD COSTS/ACRE				6,330	
TOTAL CASH OVERHEAD COSTS/TRAY				1	
TOTAL CASH COSTS/ACRE				102,152	
TOTAL CASH COSTS/TRAY				15	
NET RETURNS ABOVE CASH COSTS				9,848	
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Buildings				161	
Fuel Tanks				40	
Shop/Hand Tools				72	
Harvest Carts				9	
Lateral Lines				54	
Sprinkler Pipe				133	
Equipment				824	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				1,294	
TOTAL NON-CASH OVERHEAD COSTS/TRAY				0	
TOTAL COST/ACRE				103,445	
TOTAL COST/TRAY				15	
NET RETURNS ABOVE TOTAL COST				8,555	

UC COOPERATIVE EXTENSION – UC DAVIS AGRICULTURAL AND RESOURCE ECONOMICS

TABLE 3. MONTHLY CASH COSTS PER ACRE TO PRODUCE AND HARVEST ORGANIC STRAWBERRIES

	SEP 23	OCT 23	NOV 23	DEC 23	JAN 24	FEB 24	MAR 24	APR 24	MAY 24	JUN 24	JUL 24	AUG 24	SEP 24	OCT 24	Total
Cultural:															
Cover Crop (1 per 2 Crops)	75														75
Soil Samples (2 per 27 Acres)	5														5
Subsoil 5X	263														263
Disc 4X	66														66
Level (Landplane)	71														71
Chisel 2X	40														40
Sprinkler Irrigation 2X (Pre/Post Plant)	128	83													211
Compost Application	680														680
Rice/Feather/Gypsum Application		2,995													2,995
List / Shape 48" Beds		34													34
Install Drip Tape/System		1,559													1,559
Open Trench for Drip		18													18
Grade Field Roads 2X		33													33
Lay Mulch		831													831
Punch Holes		77													77
Plant (Includes 7% Replant)		5,943													5,943
Roll Plants to Pack		10													10
Hand Weed				537	537	537	537	537	537	537	537	537	537		5,372
Runner Removal				305	305	305	305	305	305	305	305	305	305		3,053
Release Persimilis (Predatory Mites)						389	389	194							972
Mite Control (Vestis)						12	12								25
Cultivate 3X						17	17	17							50
Foliar Fertilize (Biomin/MaxiCrop)						55	55	55	55	55	55	55	55		437
Trap Vertebrates 5X						56	20	20	20	20					134
Drip Irrigate (Season)							140	140	140	140	140	140	139		976
Fertigate (Agrothrive/4-2-2)							158	158	237	158	158	237	158		1,262
Lygus Bug Control (Vacuum)								193	193	193	193	193	193	193	1,351
Powdery Mildew Control (Sulfur)							17	17	17	35	17	17	17	17	156
Worm Control (Dipel)									46	46					93
Year End Cleanup														560	560
Disc 2X														33	33
PCA	10	10	10	10	10	10	10	10	10	10	10	10	10	10	140
Pickup Truck Use														89	89
ATV														24	24
TOTAL CULTURAL COSTS	1,338	11,593	10	852	852	1,380	1,659	1,645	1,559	1,498	1,415	1,494	1,414	926	27,636
Harvest:															
Harvest Organic Strawberries								2,476	5,894	12,246	12,246	8,841	5,894	1,498	49,094
Load/Haul								48	72	96	72	96	68	46	499
Cool								350	840	1,750	1,750	1,260	840	210	7,000
Assessments - CSC								9	21	44	44	32	21	5	175
Market/Sales Fee								448	1,075	2,240	2,240	1,613	1,075	269	8,960
TOTAL HARVEST COSTS	0	0	0	0	0	0	0	3,331	7,902	16,376	16,352	11,841	7,898	2,027	65,727
Interest on Operating Capital @9.00%	10	97	97	103	110	120	133	170	241	375	508	608	-92	-22	2,458
TOTAL OPERATING COSTS/ACRE	1,348	11,690	107	956	962	1,501	1,792	5,146	9,702	18,249	18,275	13,943	9,221	2,931	95,822

UC COOPERATIVE EXTENSION – UC DAVIS AGRICULTURAL AND RESOURCE ECONOMICS

TABLE 3. CONTINUED

	SEP 23	OCT 23	NOV 23	DEC 23	JAN 24	FEB 24	MAR 24	APR 24	MAY 24	JUN 24	JUL 24	AUG 24	SEP 24	OCT 24	Total
CASH OVERHEAD															
Office Expense	57	57	57	57	57	57	57	57	57	57	57	57	57	57	800
Land Rent	229	229	229	229	229	229	229	229	229	229	229	229	229	229	3,200
Food Safety														112	112
Liability Insurance														19	19
Field Sanitation	3	3	3	3	3	3	3	3	3	3	3	3	3	3	45
Water & Nutrient Management Programs														95	95
Organic Certification/Registration														360	360
Ranch Supervisor	107	107	107	107	107	107	107	107	107	107	107	107	107	107	1,500
Property Taxes						28					28				56
Property Insurance						2					2				4
Investment Repairs	10	10	10	10	10	10	10	10	10	10	10	10	10	10	138
TOTAL CASH OVERHEAD COSTS	406	406	406	406	406	436	406	406	406	406	436	406	406	992	6,330
TOTAL CASH COSTS/ACRE	1,754	12,096	513	1,362	1,368	1,937	2,197	5,552	10,108	18,655	18,711	14,349	9,626	3,923	102,152

UC COOPERATIVE EXTENSION – UC DAVIS AGRICULTURAL AND RESOURCE ECONOMICS

TABLE 4. RANGING ANALYSIS

COSTS PER ACRE AND PER TRAY AT VARYING YIELDS TO PRODUCE AND HARVEST ORGANIC STRAWBERRIES

	YIELD (TRAY)						
	5,500	6,000	6,500	7,000	7,500	8,000	8,500
OPERATING COSTS/ACRE:							
Cultural	27,636	27,636	27,636	27,636	27,636	27,636	27,636
Harvest	51,735	56,399	61,063	65,727	70,392	75,056	79,720
Interest on Operating Capital @ 9.00%	2,251	2,320	2,389	2,458	2,528	2,597	2,666
TOTAL OPERATING COSTS/ACRE	81,622	86,355	91,088	95,822	100,555	105,289	110,022
TOTAL OPERATING COSTS/TRAY	14.84	14.39	14.01	13.69	13.41	13.16	12.94
CASH OVERHEAD COSTS/ACRE	6,330	6,330	6,330	6,330	6,330	6,330	6,330
TOTAL CASH COSTS/ACRE	87,951	92,685	97,418	102,152	106,885	111,618	116,352
TOTAL CASH COSTS/TRAY	15.99	15.45	14.99	14.59	14.25	13.95	13.69
NON-CASH OVERHEAD COSTS/ACRE	1,294	1,294	1,294	1,294	1,294	1,294	1,294
TOTAL COSTS/ACRE	89,245	93,979	98,712	103,445	108,179	112,912	117,646
TOTAL COSTS/TRAY	16.00	16.00	15.00	15.00	14.00	14.00	14.00

Net Return Per Acre Above Operating Costs For Organic Strawberries

PRICE ($/tray)	YIELD (tray/acre)						
Organic Strawberry	5,500	6,000	6,500	7,000	7,500	8,000	8,500
12.00	-15,622	-14,355	-13,088	-11,822	-10,555	-9,289	-8,022
13.00	-10,122	-8,355	-6,588	-4,822	-3,055	-1,289	478
15.00	878	3,645	6,412	9,178	11,945	14,711	17,478
16.00	6,378	9,645	12,912	16,178	19,445	22,711	25,978
17.00	11,878	15,645	19,412	23,178	26,945	30,711	34,478
19.00	22,878	27,645	32,412	37,178	41,945	46,711	51,478
20.00	28,378	33,645	38,912	44,178	49,445	54,711	59,978

Net Return Per Acre Above Cash Costs For Organic Strawberries

PRICE ($/tray)	YIELD (tray/acre)						
Organic Strawberry	5,500	6,000	6,500	7,000	7,500	8,000	8,500
12.00	-21,951	-20,685	-19,418	-18,152	-16,885	-15,618	-14,352
13.00	-16,451	-14,685	-12,918	-11,152	-9,385	-7,618	-5,852
15.00	-5,451	-2,685	82	2,848	5,615	8,382	11,148
16.00	49	3,315	6,582	9,848	13,115	16,382	19,648
17.00	5,549	9,315	13,082	16,848	20,615	24,382	28,148
19.00	16,549	21,315	26,082	30,848	35,615	40,382	45,148
20.00	22,049	27,315	32,582	37,848	43,115	48,382	53,648

Net Return Per Acre Above Total Costs For Organic Strawberries

PRICE ($/tray)	YIELD (tray/acre)						
Organic Strawberry	5,500	6,000	6,500	7,000	7,500	8,000	8,500
12.00	-23,245	-21,979	-20,712	-19,445	-18,179	-16,912	-15,646
13.00	-17,745	-15,979	-14,212	-12,445	-10,679	-8,912	-7,146
15.00	-6,745	-3,979	-1,212	1,555	4,321	7,088	9,854
16.00	-1,245	2,021	5,288	8,555	11,821	15,088	18,354
17.00	4,255	8,021	11,788	15,555	19,321	23,088	26,854
19.00	15,255	20,021	24,788	29,555	34,321	39,088	43,854
20.00	20,755	26,021	31,288	36,555	41,821	47,088	52,354

UC COOPERATIVE EXTENSION – UC DAVIS AGRICULTURAL AND RESOURCE ECONOMICS

TABLE 5. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS FOR ORGANIC STRAWBERRIES

ANNUAL EQUIPMENT COSTS

						Cash Overhead		
Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur-ance	Taxes	Total
24	55HP 2WD Tractor	66,000	10	19,495	8,617	30	427	9,075
24	75HP 4WD Tractor	90,000	15	17,521	10,043	38	538	10,619
24	90HP 4WD Tractor	94,080	20	12,072	9,505	38	531	10,073
24	ATV 4WD	10,020	7	3,801	1,518	5	69	1,592
24	Pickup Truck 1/2 Ton	38,880	7	14,749	5,891	19	268	6,179
24	Bug Vacuum	39,200	2	19,650	12,622	21	294	12,937
24	Lister/Shaper - 3 Row	5,400	15	518	622	2	30	654
24	Drip Machine - 1 Row	3,780	15	363	435	1	21	457
24	Punch Machine	5,400	15	518	622	2	30	654
24	Mulch Machine - 2 Row	24,300	15	2,333	2,798	9	133	2,941
24	Flatbed Truck - 1-1/2 Ton #1	62,650	10	18,506	8,180	29	406	8,614
24	Ripper-5 Shank 14'	11,664	10	2,063	1,617	5	69	1,691
24	Disc Offset 14'	23,545	10	4,164	3,265	10	139	3,413
24	Landplane 15'	20,250	15	1,944	2,332	8	111	2,451
24	Chisel 14'	9,800	15	941	1,128	4	54	1,186
24	Trailer-Pipe	2,322	20	129	238	1	12	251
24	Sprayer 20' boom	3,920	4	1,443	871	2	27	900
24	Cultivator - 3 Row	10,640	20	555	1,092	4	56	1,152
24	Flatbed Truck - 1-1/2 Ton #2	62,650	10	18,506	8,180	29	406	8,614
24	Rear Blade - 6'	1,092	15	105	126	0	6	132
24	42HP 4WD Tractor	50,400	15	9,812	5,624	21	301	5,946
24	Ringroller 8'	4,500	15	432	518	2	25	545
	TOTAL	640,493	-	149,618	85,845	280	3,951	90,076
	70% of New Cost*	448,345	-	104,733	60,091	196	2,765	63,053

*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
INVESTMENT								
Buildings	53,095	30	0	4,828	19	265	1,062	6,174
Fuel Tanks	11,850	20	830	1,212	5	63	237	1,517
Shop/Hand Tools	18,610	15	1,303	2,160	7	100	372	2,639
Harvest Carts	1,125	5	0	284	0	6	23	313
Lateral Lines	6,480	5	0	1,634	2	32	324	1,992
Sprinkler Pipe	42,726	20	21,363	3,979	23	320	2,136	6,458
TOTAL INVESTMENT	133,886	-	23,496	14,097	56	787	4,154	19,093

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Office Expense	30.00	acre	800.00	24,000
Land Rent	30.00	acre	3200.00	96,000
Food Safety	30.00	acre	112.00	3,360
Liability Insurance	30.00	acre	18.90	567
Field Sanitation	30.00	acre	45.00	1,350
Water & Nutrient Management Programs	30.00	acre	95.00	2,850
Organic Certification/Registration	30.00	acre	360.00	10,800
Ranch Supervisor	30.00	acre	1500.00	45,000

TABLE 6. HOURLY EQUIPMENT COSTS FOR ORGANIC STRAWBERRIES

Yr	Description	Strawberries Hours Used	Total Hours Used	Capital Recovery	Cash Overhead Insur-ance	Cash Overhead Taxes	Operating Lube& Repairs	Operating Fuel	Operating Total Oper.	Total Costs/Hr.
24	55HP 2WD Tractor	882	1200	5.03	0.02	0.25	5.48	13.99	19.47	24.76
24	75HP 4WD Tractor	101	800	8.79	0.03	0.47	7.13	19.08	26.21	35.50
24	90HP 4WD Tractor	197	800	8.32	0.03	0.46	5.79	22.89	28.69	37.50
24	ATV 4WD	16	285	3.73	0.01	0.17	1.31	3.07	4.37	8.28
24	Pickup Truck 1/2 Ton	46	285	14.47	0.05	0.66	5.01	11.50	16.51	31.69
24	Bug Vacuum	641	750	11.78	0.02	0.27	0.00	0.00	0.00	12.07
24	Lister/Shaper - 3 Row	14	133	3.27	0.01	0.16	1.21	0.00	1.21	4.65
24	Drip Machine - 1 Row	54	100	3.05	0.01	0.15	1.05	0.00	1.05	4.25
24	Punch Machine	41	133	3.27	0.01	0.16	0.69	0.00	0.69	4.13
24	Mulch Machine - 2 Row	54	133	14.73	0.05	0.70	3.09	0.00	3.09	18.56
24	Flatbed Truck - 1-1/2 Ton #1	61	200	28.63	0.10	1.42	10.03	21.08	31.11	61.26
24	Ripper-5 Shank 14'	101	200	5.66	0.02	0.24	3.02	0.00	3.02	8.94
24	Disc Offset 14'	38	200	11.43	0.03	0.48	4.33	0.00	4.33	16.27
24	Landplane 15'	27	200	8.16	0.03	0.39	3.45	0.00	3.45	12.03
24	Chisel 14'	16	133	5.94	0.02	0.28	2.28	0.00	2.28	8.52
24	Trailer-Pipe	35	200	0.83	0.00	0.04	0.05	0.00	0.05	0.93
24	Sprayer 20' boom	55	375	1.63	0.00	0.05	1.25	0.00	1.25	2.93
24	Cultivator - 3 Row	20	100	7.65	0.03	0.39	2.09	0.00	2.09	10.16
24	Flatbed Truck - 1-1/2 Ton #2	81	200	28.63	0.10	1.42	10.03	21.08	31.11	61.26
24	Rear Blade - 6'	18	100	0.88	0.00	0.04	0.15	0.00	0.15	1.08
24	42HP 4WD Tractor	51	1066	3.69	0.01	0.20	2.97	10.68	13.65	17.56
24	Ringroller 8'	5	133	2.73	0.01	0.13	0.57	0.00	0.57	3.44