
UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2005

**SAMPLE COSTS TO PRODUCE
FRESH MARKET
RASPBERRIES**



Central Coast Region

Santa Cruz and Monterey Counties

Mark Bolda

Laura Tourte

Karen M. Klonsky

Richard L. De Moura

Farm Advisor, UC Cooperative Extension, Santa Cruz County.

Farm Advisor, UC Cooperative Extension, Santa Cruz County.

UC Cooperative Extension Specialist, Department of Agricultural and Resource Economics, UC Davis.

Staff Research Associate, Department of Agricultural and Resource Economics, UC Davis.

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

**SAMPLE COSTS TO PRODUCE FRESH MARKET RASPBERRIES
Central Coast Region – Santa Cruz & Monterey Counties 2005**

CONTENTS

INTRODUCTION	2
ASUMPTIONS	3
Establishment Cultural Practices and Material Inputs	3
Production Cultural Practices and Material Inputs	4
Labor, Equipment, and Interest Costs	6
Cash Overhead Costs.....	7
Non-Cash Overhead Costs	7
REFERENCES	10
Table 1. Sample Costs per Acre to Establish Raspberries	11
Table 2. Material Costs per Acre to Establish Raspberries	12
Table 3. Costs per Acre to Produce Raspberries	13
Table 4. Costs and Returns per Acre to Produce Raspberries	14
Table 5. Monthly Cash Costs to Produce Raspberries	15
Table 6. Range Analysis	16
Table 7. Whole Farm Annual Equipment, Investment and Business Overhead.....	17
Table 8. Hourly Equipment Costs.....	17
Table 9. Costs and Returns Per Acre Two Year Summary	18
Table 10. Operations with Equipment – Establishment and Production.....	19

INTRODUCTION

The sample costs to produce raspberries in Santa Cruz and Monterey Counties are presented in this study. The study is intended as a guide only, and can be used to make production decisions, determine potential returns, prepare budgets and evaluate production loans. The practices described are based on production procedures considered typical for this crop and area, and may not apply to every farm. Sample costs for labor, materials, equipment and custom services are based on current figures. A blank column, "Your Cost", is provided to enter your actual costs on Tables 1 and 3.

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) 752-3589 or the UC Cooperative Extension office in your county.

Sample Cost of Production studies for many commodities from 1931 to the present are available and can be requested through the Department of Agricultural and Resource Economics, UC Davis, (530) 752-4424. Current studies may also be downloaded from the department Web site <http://coststudies.ucdavis.edu> or obtained from selected county UC Cooperative Extension offices.

ASSUMPTIONS

The following assumptions refer to calculations in Tables 1 to 10 beginning on page 11 and pertain to sample costs to establish and produce raspberries in the Central Coast Region - Santa Cruz and Monterey Counties. Practices described represent methods considered typical for raspberry production in the region. The costs, practices, and materials will not be applicable to all situations every production year. Cultural practices, materials, and raspberry production costs vary by grower and region, and differences can be significant. The practices and inputs used in the 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 farm consists of 30 contiguous acres of land. Raspberries are planted on 15 acres. Other berries are planted on 12 acres; roads, the irrigation system and farmstead account for three acres. In this area, a few operations will rotate berry crops with vegetables and other row crops. The grower rents the land for \$2,000 per acre per year, and owns the equipment and machinery.

Establishment Cultural Practices and Material Inputs

Tables 1, 2, 10

Raspberries are a perennial crop that, when well managed, can produce for up to 20 years. However, in California, raspberries are managed as a biennial crop, the intent of which is to keep production and economic returns high. In this study we consider costs and returns associated with the establishment of a raspberry crop along with costs and returns for two production cycles. The establishment costs comprise the seven months from August in one calendar year to February of the following calendar year. That is, from land preparation to the installation of the trellis and drip irrigation systems. The production cycle is from March to October for each of the two years.

Land Preparation. Land is prepared for planting by first subsoiling in August, followed by disking three times and rototilling once. Six tons of well composted manure is applied and incorporated into the soil at the same time as the disking operations. Beds are then listed and shaped. Fertilizer is applied prior to planting. During the growing season, the grower applies additional fertilizer through the drip irrigation system as shown below.

Fertilization. To decide upon the fertilizer and rate to be applied, a soil sample is taken for soil analysis in the spring before starting land preparation. Composted manure at six tons per acre is applied during land preparation. Four hundred pounds of 15-15-15 is band applied before planting. Additional fertilizer may be applied during the growing season.

Pest Management. The pesticides and rates mentioned in this cost study as well as other materials available are listed in *UC Integrated Pest Management Guidelines, Caneberries*. Pesticides mentioned in the study are commonly used, but are not recommendations.

Soil Fumigation. The soil is fumigated with a combination of Telone and chloropicrin to manage pests, which can include diseases, arthropods and weed seeds. This operation is done after the ground has been subsoiled, disked and rototilled, and approximately three weeks prior to planting. A custom operator fumigates the field using a rate of 14 gallons per acre of Telone and 200 pounds per acre of chloropicrin. The cost of the application in this study is \$1,650 per acre.

Planting. Several raspberry varieties are planted in the region, however, no specific variety is assumed in this study. The price depends on the variety selected and on a possible storage charge; for this study the cost per plant is \$0.48. Planting is done by hand, and takes about 12 man-hours per acre to plant at an approximate cost of \$124 per acre. Raspberries are generally transplanted from late November through March on 10-foot rows with a between plant spacing of 18-inches for a total plant density of 2,900 plants per acre. Leader buds and root suckers, which grow from the crown and roots, will fill in the spaces in between plants during the growing season.

Raspberries are classified as floricanes (summer bearing) and primocanes (fall bearing) varieties. Floricane-bearing raspberries grow vegetatively during the first season, and bear fruit during the second season. After harvest, canes that produced fruit should be removed leaving the new canes that will produce fruit to be harvested in the following year. Because of the cost and effort of maintaining the floricanes-bearing varieties vegetatively for the first season, many growers opt for primocane varieties, which produce fruit bearing canes every year starting from the fall of the first growing year. This study assumes that the grower uses primocane-bearing varieties.

Irrigation. After transplanting, a temporary overhead sprinkler irrigation system is set-up to irrigate the crop for three weeks and then removed. Overhead irrigation on established plants may increase the incidence of fruit rot and other diseases as the crop matures. During the winter, crop growth is generally dependent on seasonal rains, but later in the season a drip irrigation system is installed and used to irrigate the crop. The drip line is tied to the lower wire of the trellis with emitters placed every 18-inches. The drip line is discarded after the second harvest, when the trellis is removed.

Trellising. Based on a square acre basis (200 ft x 218 ft), the berries will have 20 rows per acre. The trellis system consists of at least four wires; two located 20-inches from the ground, and another two at 54-inches from the ground. Two-inch posts separated 15 feet and four-inch end posts that anchor them, support the wires. Per row cost of materials is as follows: fourteen two-inch by eight-foot pressure treated posts at \$6.25 each; two four-inch by seven-foot pressure treated end posts at \$7.25 each; 16 gauge trellising wire at \$7.91 per 1,000 feet; four line post clips at \$0.06 per post. The total cost (materials plus labor) of installing the trellis was estimated at \$2,200 per acre. Because trellis materials can be used for six years, this cost is included in non-cash or investment overhead. However, labor cost is considered part of the establishment cost. Total labor was estimated at 41 hours per acre.

Shade. A shade structure is set up in the spring to provide shade for the labor and for a sorting and packing area at harvest. The costs include the setup labor and miscellaneous expenses for materials. The shade structure may also be used for future crops.

Production Cultural Practices and Material Inputs

Tables 3 – 10

Irrigation. Depending on effective rainfall and available soil moisture, plants are irrigated from March through September using between one-half and one-inch of water per week during the growing season. Total irrigation water during the season is approximately two acre-feet. The cost of water includes pumping costs of \$90 per acre foot or \$7.50 per acre inch plus labor. Growers producing within the Pajaro Valley Water Management Agency (PVWMA) district are charged an additional \$160 per acre foot or \$13.33 per acre inch augmentation fee for all pumped (well-drawn) water.

Fertilization. In season fertilizers are applied through the drip system. Leaf analysis is done around mid-season (May) to determine the nutritional needs of the plants. It is recommended that plants receive liquid fertilizer via the irrigation system through the growing season roughly every 14 days. A common liquid fertilizer is 15-10-30, although a variety of formulations are commercially available.

Pest Management. The pesticides and rates mentioned in this cost study are listed in *UC Integrated Pest Management Guidelines, Caneberries*. For information on other pesticides available, pest identification, monitoring, and management visit the UC IPM website at www.ipm.ucdavis.edu or contact your local UCCE farm advisor. Information and pesticide use permits are available through the local county agricultural commissioner's office. Pesticides mentioned in this study are used to calculate rates and costs. Although growers commonly use the pesticides mentioned, other pesticides are available. Spray adjuvants are recommended for use with many pesticides, but are not accounted for in this study. Pesticide costs vary by location, brand, and grower volume. Pesticide costs in this study are from a single dealer and shown as full retail.

Pest Control Adviser (PCA). The PCA monitors the field for agronomic problems including pests, diseases, and nutritional status. Growers may hire private consultants on a per acre basis or receive the service as part of an agreement with an agricultural chemical and fertilizer company. Costs of \$100 per acre for a private PCA are included in this study.

Diseases. Fungicides are applied in the spring to control diseases such as yellow rust (copper sulfate, 5 pounds per acre) and Botrytis (Elevate, 1.5 pounds per acre) In this study, Elevate is applied three times – twice in April and once in June; Copper (Kocide) is applied twice in May.

Insects (Arthropods). Savey is applied for the control of two-spotted spider mite, once in April at 6 ounces per acre.

Weeds. For this study, weed control is done by hand (hoeing) in May and June, and is assumed to take nine man-hours per month. Alternately, a grower may chose to use a disk harrow during spring and summer. The use of a disk harrow to cultivate weeds between rows is a delicate operation because of the risk posed to injuring the raspberries' shallow root system. Spacing within rows is important so that vegetative growth covers the ground to help shade out weeds.

Pollination. Bees are needed for pollination, at a rate of two hives per acre. Bee hives are set up by a contractor in the winter and removed by the end of that season. The cost is \$30 per hive.

Harvest. Harvest season starts in August and extends through October, and may be longer if the crop is grown using protective tunnels. Raspberries are harvested by hand every few days at an average seasonal piece rate cost of \$4.00 per flat. Early season (lower yields), the piece rate cost is usually higher. Crew size and number of crews may vary through the season depending upon the yield. Picking rate per picker ranges from one to three flats per hour, with the lesser rate occurring early and late in the season. For this study, it assumed that an average picking rate for the season is 2.5 flats per hour. The fruit is picked using one gallon buckets; then field sorted and packed into a flat containing 12 one-half pint plastic clam shells. Each full flat weighs 7 pounds. The area under the shade structure, constructed during the establishment period, is used for packing and sorting. Harvesting consist of one crew of 25 that hand picks the berries, a crew supervisor and a checker-loader who records the flats picked by each crewmember and who also loads the flats on the pallets on the truck. The truck holds up to two pallets with 144 flats and takes one hour round trip to deliver the fruit to the cooler. To prevent the fruit from heating up, the truck should make deliveries to the cooler with less than full loads. The fruit is then transported by the grower to a cooler, where the grower pays \$0.85 per flat for cooling services.

Yields and Returns. This study assumes an average marketable yield of 3,000 seven-pound flats per acre, which is equivalent to approximately 10 tons per acre. The expected unit price is \$12 per flat based on Santa Cruz County Agricultural Commissioner's Crop Reports and the USDA Agricultural Marketing Service shipping point prices from Salinas/Watsonville area. Estimated returns for a range of yields and prices are shown in Table 6.

Post harvest pruning/clean up. After the first harvest, the dead canes or those that have fruited are pruned out by hand, at 30 hours per acre. Part of the pruning operation will include adjustment of the primocanes in the trellis for the following year if the field is left in place. Canes left on the ground are then disked shallowly and incorporated into the soil. By the end of the second year the crop is completely removed, as well as the drip tape and the trellis system. The trellis may be reusable, but the drip tape is discarded. Trellis and drip tape removal are done by hand. The canes are disked to prepare the land for a subsequent crop: raspberries, another berry crop, or a vegetable crop depending on a grower's rotation scheme. The postharvest clean up operation takes approximately 18 hours per acre to be completed. For simplicity purposes the cost of pruning after the first harvest (30 hours) and the cost of the final clean up operation (18 hours) are averaged over the two production years.

Labor, Equipment, and Interest Costs

Pickup/ATV. It is assumed that the pickup is used for business and personal use. The grower uses the ATV for collecting the soil and leaf samples and is included in those costs. The ATV is also used to check the field, monitor the irrigation, and other miscellaneous use. The time and mileage use for the pickup and ATV operations are estimated and not taken from any specific data.

Labor. The basic hourly wage for equipment operators is \$11.50 per hour and for general labor is \$7.50 per hour. At harvest, the pickers receive piece rate pay of \$4.00 per flat. This is an average seasonal piece rate cost. At the beginning of the season due to lower yields, the piece rate is higher (\$4.50 to \$5.00) than during the peak season. Adding payroll overhead of 38% to the hourly wage gives labor rates of \$15.87 for equipment operators and \$10.35 per hour 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, 2005 (California Department of Insurance). Labor for operations involving machinery are 20% higher than the operation time given in Table 3 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 American Society of Agricultural Engineers (ASAE). Fuel and lubrication costs are also determined by ASAE equations based on maximum power takeoff (PTO) horsepower, and fuel type. Prices for on-farm delivery of diesel and gasoline are \$2.00 and \$2.25 per gallon, respectively. The price is based on the growers May, 2005 delivery invoice. The cost may include a 2% local sales tax on diesel fuel and 8% sales tax on gasoline. Gasoline also includes federal and state excise tax, which are refundable for on-farm use when filing your income tax. The fuel, lube, and repair cost per acre for each operation in Table 3 is determined by multiplying the total hourly operating cost in Table 8 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 7.65% 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. The risks associated with producing and marketing raspberries 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, agronomic and market risks that affect the profitability and economic viability.

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, liability and property insurance, sanitation services, equipment repairs, and management.

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 2 on a per acre basis.

Insurance. Insurance for farm investments vary depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.690% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$529 for the entire farm.

Office Expense. Office and business expenses are estimated at \$300 per producing acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, road maintenance, utilities, and miscellaneous expenses.

Land Rent. The grower pays \$2,000 per acre per year for the 30-acres or \$2,222 per acre per producing acre (27 acres).

Sanitation Services. Sanitation services provide a double portable toilet and single toilet with washing equipment and cost the farm \$3,080 annually.

Food Safety Program. Many growers of fresh market commodities such as raspberries now incorporate and participate in food safety programs for their operations. Part of a food safety program is participation in third party (independent) audits, that are done to accommodate buyer requests and to enhance marketability of the crop. Costs will vary depending upon farm or inspection circumstances. For this study, costs for the farm are estimated at \$750 per year.

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 $((\text{Purchase Price} - \text{Salvage Value}) \times \text{Capital Recovery Factor}) + (\text{Salvage Value} \times \text{Interest Rate})$.

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery (tractors and implements) the remaining value is a percentage of the new cost of the investment (Boehlje and Eidman). The percent remaining value is calculated from equations developed by the American Society of Agricultural Engineers (ASAE) based on equipment type and years of life. The life in years is estimated by dividing the wear out 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 the purchase price because land does not depreciate. The purchase price and salvage value for equipment and investments are shown in Table 7.

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 6.01% used to calculate capital recovery cost is the USDA-ERSs 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 used effectively in the agricultural sector.

Buildings. The 1,400 square feet of metal buildings may be a shop, overheads, shade structures or storage.

Trellis. The trellis is installed in the establishment year soon after planting. The trellis system has a life of six years and is removed at the end of the growing season and used on other plantings. The cost includes the materials whereas the labor is charged to the years affected by the installation and removal.

Shop/Field Tools. Shop, hand, and various small field tools are included in these costs. Tools vary considerably from farm to farm and the cost does not represent any specific inventory.

Irrigation Pump & Well. This study assumes that the grower refurbished the 40 HP electric pump and well that services the farm. In general, growers in the region are responsible for the portion above the ground such as the pump, and the landowner is responsible for what is below ground such as the well running dry.

Irrigation System. The irrigation system includes the filtration system and laterals that connect to the drip line.

Water is pumped through the filtration station into the main lines. Reusable telescoping lateral lines are buried at the edge of the raspberry field and are connected to the main and drip lines. The drip lines are included in the establishment costs because they will be replaced at the end of the two year period when the berry canes are removed.

Sprinkler Pipe. The sprinkler system is an estimated cost by a local dealer for enough sprinkler pipe, sprinklers and main line to make five acre sets. The pipe is hand movable and may be used on all farm crops.

Establishment Cost. Costs to establish the berry canes are used to determine capital recovery expenses, depreciation, and interest on investment for the production years. Establishment cost is the sum of the costs for land preparation, trellis system labor, drip tape, planting, plants, cash overhead and expenses for establishing the

canes. The costs cover a seven month period from August to February. The Total Cash Cost on Table 1 represents the establishment cost. For this study the cost is \$5,868 per acre or \$88,028 for the 15-acre field. The establishment cost is spread over the two crop production years.

Equipment Costs. 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 in the Whole Farm Equipment, Investment and Business Overhead Tables. 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.

REFERENCES

- American Society of Agricultural Engineers. 1994. American Society of Agricultural Engineers Standards Yearbook. Russell H.Hahn and Evelyn E. Rosentreter (Eds.). St. Joseph, MO, 41st. edition.
- Bervejillo, Jose E., Mark Bolda, Laura Tourte, and Karen Klonsky. 2003. *Sample Cost to Produce Fresh Market Raspberries, Central Coast*. University of California Cooperative Extension, Davis, CA.
- Boehlje, Michael D., and Vernon R. Eidman. 1984. *Farm Management*. John Wiley and Sons. New York, NY.
- California State Department of Food and Agriculture. 2000-2004. Final Grape Crush Report. California Department of Food and Agriculture. Sacramento, CA.
- Santa Cruz County Agricultural Commissioner. 2004. *Santa Cruz County Annual Crop and Livestock Report, Fruits*. Santa Cruz County, Watsonville, CA. <http://agdept.com>
- University of California Statewide IPM Project. 2003. *UC Pest Management Guidelines, Caneberries*. University of California, Davis, CA. <http://www.ipm.ucdavis.edu>
- United States Department of Agriculture, Agricultural Marketing Service. <http://www.ams.usda.gov>
- United States Department of Agriculture-Economic Reporting Service. *Farm Financial Ratios Indicating Solvency and Profitability 1960 – 2002, California*. 2005. Internet; accessed January 4, 2005. www.ers.usda.gov/data/farbalancesheet/fbsdmu.htm

UC COOPERATIVE EXTENSION

Table 1. COSTS PER ACRE to ESTABLISH RASPBERRIES
CENTRAL COAST REGION - Santa Cruz and Monterey Counties 2005

Operation	Operation	Field	Cash and Labor Cost per acre				Total Cost	Your Cost
	Time (Hrs/A)	Labor	Labor Cost	Fuel,Lube & Repairs	Material Cost	Custom/Rent		
Fertilize: Soil Sample (1)	0.07	0.00	1	0	0	2	4	
Land Prep: Subsoil	0.39	0.00	7	5	0	0	12	
Land Prep: Disk 3X	0.52	0.00	10	6	0	0	16	
Land Prep: Rototill	0.65	0.00	12	8	0	0	20	
Fertilize: (composted manure)	0.34	0.00	6	5	138	0	149	
Disease: Fumigate (Telone, Chloropricrin)	0.00	0.00	0	0	0	1,650	1,650	
Land Prep: List and Shape Beds	0.46	0.00	9	5	0	0	14	
Fertilize: Band (15-15-15)	0.34	0.00	6	4	77	0	88	
Plant:	0.00	12.00	124	0	1,392	0	1,516	
Irrigate: Sprinkler setup/remove	2.00	2.00	59	17	0	0	76	
Irrigate: Sprinkle	0.00	1.00	10	0	62	0	73	
Trellis: Install (labor only)	1.00	40.00	433	9	0	0	442	
Irrigate: Install (tape & labor)	0.52	2.00	31	5	44	0	79	
Harvest: Shades (setup)	0.45	0.45	5	0	25	0	30	
ATV	0.38	0.00	7	1	0	0	8	
Pickup	2.33	0.00	44	13	0	0	58	
TOTAL CULTURAL COSTS	9.00	57.45	766	79	1,739	1,652	4,235	
Interest on operating capital @ 7.65%							126	
TOTAL OPERATING COSTS/ACRE			766	79	1,739	1,652	4,361	
Cash Overhead: *								
Liability Insurance							12	
Office Expense							176	
Sanitation Fee							67	
Land Rent							1,176	
Food Safety Audit							0	
Property Taxes							16	
Property Insurance							11	
Investment Repairs							49	
TOTAL CASH OVERHEAD							1,507	
TOTAL CASH COSTS/ACRE	0.0		766	79	1,739	1,652	5,868	

*Costs are for 7 months (Aug to Feb)

UC COOPERATIVE EXTENSION

Table 2. MATERIAL COSTS PER ACRE to ESTABLISH RASPBERRIES

CENTRAL COAST REGION - Santa Cruz and Monterey Counties 2005

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
OPERATING COSTS					
Custom:					
Soil Analysis	0.07	each	35.00	2	
Fumigate (Telone, Chloropicrin)	1.00	acre	1,650.00	1,650	
Fertilizer:					
Manure (Composted)	6.00	ton	23.00	138	
15-15-15	400.00	lb	0.19	77	
Plants:					
Raspberries	2,900.00	each	0.48	1,392	
Water:					
Water-Pumped	3.00	acin	7.50	23	
Water-PVWMA fee	3.00	acin	13.33	40	
Drip Tape	4,400.00	foot	0.01	44	
Miscellaneous:					
Shade Materials	1.00	acre	25.00	25	
Labor - machine	10.78	hrs	15.87	171	
Labor - non-machine	57.45	hrs	10.35	595	
Fuel - Gas	0.30	gal	2.25	1	
Fuel - Diesel	25.63	gal	2.00	51	
Lube				8	
Machinery Repair				19	
Interest on Operating Capital @ 7.65%				126	
TOTAL OPERATING COSTS/ACRE				4,361	
CASH OVERHEAD COSTS*					
Liability Insurance				12	
Office Expense				176	
Sanitation Fee				67	
Land Rent				1,176	
Property Taxes				16	
Property Insurance				11	
Investment Repairs				49	
TOTAL CASH OVERHEAD				1,507	
TOTAL CASH COSTS/ACRE				5,868	

*Costs are for 7 months (Aug to Feb)

UC COOPERATIVE EXTENSION
Table 3. COSTS PER ACRE to PRODUCE RASPBERRIES
 CENTRAL COAST REGION - Santa Cruz and Monterey Counties 2005

Operation	Operation Time (Hrs/A)	Field Labor	Cash and Labor Cost per acre					Total Cost	Your Cost
			Labor Cost	Fuel,Lube & Repairs	Material Cost	Custom/ Rent			
Cultural:									
Pollinate: (2 hives)	0.00	0.00	0	0	0	60	60		
Irrigate: (water & labor)	0.00	10.00	104	0	500	0	603		
Fertilize: (15-10-30) through drip line	0.00	0.00	0	0	348	0	348		
Disease: Botrytis (Elevate) 3X	1.37	0.00	26	13	161	0	201		
Insect: Mites (Savey)	0.46	0.00	9	4	124	0	137		
Weed: Hand Weed	0.00	18.00	186	0	0	0	186		
Fertilize: Leaf Sample	0.07	0.00	1	0	0	5	7		
Disease: Rust (Copper)	0.92	0.00	17	9	33	0	59		
Field Clean Up (1/2 cost)	0.34	24.00	255	4	0	0	259		
PCA	0.00	0.00	0	0	0	100	100		
ATV Use	0.75	0.00	14	2	0	0	16		
Pickup Use	5.00	0.00	95	29	0	0	124		
TOTAL CULTURAL COSTS	8.91	52.00	708	61	1,167	165	2,100		
Harvest:									
Hand Pick (includes foreman & checker)	*Piece Rate	96.00	994	0	5,215	*12,000	18,209		
Haul	21.00	0.00	400	219	0	0	619		
Cool	0.00	0.00	0	0	2,550	0	2,550		
TOTAL HARVEST COSTS	21.00	96.00	1,394	219	7,765	12,000	21,378		
Interest on operating capital @ 7.65%							351		
TOTAL OPERATING COSTS/ACRE			2,101	280	8,932	12,165	23,829		
Cash Overhead:									
Liability Insurance							20		
Office Expense							300		
Sanitation Fees							114		
Land Rent (per producing acre)							2,222		
Food Safety Audit							28		
Property Taxes							41		
Property Insurance							48		
Investment Repairs							95		
TOTAL CASH OVERHEAD COSTS							2,868		
TOTAL CASH COSTS/ACRE							26,697		
Non-cash Overhead:									
			Per producing Acre		Annual Cost Capital Recovery				
Buildings			1,821		132		132		
Trellis			147		30		30		
Shop/Hand Tools			467		46		46		
Sprinkler Pipe (5 acre sets)			222		30		30		
Irrigation System (filtration)			1,000		78		78		
Pump & Well			1,108		87		87		
Raspberry Establishment			5,868		3,201		3,201		
Equipment			2,240		317		317		
TOTAL NON-CASH OVERHEAD COSTS			12,873		3,922		3,922		
TOTAL COSTS/ACRE							30,618		

*Piece rate = \$4.00 per flat

UC COOPERATIVE EXTENSION
Table 4. COSTS and RETURNS PER ACRE to PRODUCE RASPBERRIES
 CENTRAL COAST REGION - Santa Cruz and Monterey Counties 2005

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Raspberries	3,000.00	*flat	12.00	36,000	
OPERATING COSTS					
Custom:					
Bee Hives	2.00	each	30.00	60	
Leaf Analysis	0.07	each	75.00	5	
Pest Control Adviser (PCA)/Consultant	1.00	acre	100.00	100	
Water:					
Water - Pumped	24.00	acin	7.50	180	
Water - PVWMA fee	24.00	acin	13.33	320	
Fertilizer:					
15-10-30	600.00	lb	0.58	348	
Fungicide:					
Elevate 50 WDG	4.50	lb	35.86	161	
Kocide DF (copper sulfate)	10.00	lb	3.31	33	
Insecticide:					
Savey 50WP	6.00	oz	20.69	124	
Harvest:					
Labor - Picking (piece rate)	3,000.00	flat	4.00	12,000	
Flat with 12 one-half pint clamshells (7 lbs.)	3,000.00	each	1.73	5,190	
Buckets for picking	10.00	each	2.50	25	
Cooling	3,000.00	each	0.85	2,550	
Labor (machine)	35.89	hrs	15.87	570	
Labor (non-machine)	148.00	hrs	10.35	1,532	
Fuel - Gas	63.54	gal	2.25	143	
Fuel - Diesel	19.56	gal	2.00	39	
Lube				27	
Machinery repair				71	
Interest on operating capital @ 7.65%				351	
TOTAL OPERATING COSTS/ACRE				23,829	
NET RETURNS ABOVE OPERATING COSTS				12,171	
CASH OVERHEAD COSTS:					
Liability Insurance				20	
Office Expense				300	
Sanitation Fees				114	
Land Rent (per producing acre)				2,222	
Food Safety Audit				28	
Property Taxes				41	
Property Insurance				48	
Investment Repairs				95	
TOTAL CASH OVERHEAD COSTS/ACRE				2,868	
TOTAL CASH COSTS/ACRE				26,697	
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Buildings				132	
Trellis				30	
Shop/Hand Tools				46	
Sprinkler Pipe				30	
Irrigation System (filtration)				78	
Pump & Well				87	
Raspberry Establishment				3,201	
Equipment				317	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				3,922	
TOTAL COSTS/ACRE				30,618	
NET RETURNS ABOVE TOTAL COSTS				5,382	

*Flat = 7 lbs.

UC COOPERATIVE EXTENSION
Table 5. MONTHLY COSTS PER ACRE to PRODUCE RASPBERRIES
 CENTRAL COAST REGION - Santa Cruz and Monterey Counties 2005

Beginning JAN 05	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Ending DEC 05	05	05	05	05	05	05	05	05	05	05	05	05	
Cultural:													
Pollinate: (2 hives)			60										60
Irrigate: (water & labor)			75	75	75	101	101	101	75				603
Fertilize: (15-10-30) through drip line			50	50	50	50	50	50	50				348
Disease: Botrytis (Elevate) 3X				134		67							201
Insect: Mites (Savey)				137									137
Weed: Hand Weed					93	93							186
Fertilize: Leaf Sample					7								7
Disease: Rust (Copper)					59								59
Field Clean Up (1/2 cost)										259			259
PCA			13	13	13	13	13	13	13	13			100
ATV Use			2	2	2	2	2	2	2	2			16
Pickup Use	10	10	10	10	10	10	10	10	10	10	10	10	124
TOTAL CULTURAL COSTS	10	10	210	421	309	335	175	175	150	284	10	10	2,100
Harvest:													
Hand Pick								5,455	9,100	3,653			18,209
Haul								184	310	125			619
Cool								765	1,275	510			2,550
TOTAL HARVEST COSTS	0	6,404	10,685	4,289	0	0	21,378						
Interest on operating capital	0	0	1	4	6	8	9	51	120	150	0	0	351
TOTAL OPERATING COSTS/ACRE	10	10	211	425	315	343	185	6,631	10,955	4,722	10	10	23,829
Cash Overhead:													
Liability Insurance	20												20
Office Expense	25	25	25	25	25	25	25	25	25	25	25	25	300
Sanitation Fees			14	14	14	14	14	14	14	14			114
Land Rent (per producing acre)	185	185	185	185	185	185	185	185	185	185	185	185	2,222
Food Safety Audit							28						28
Property Taxes				20								20	41
Property Insurance	48												48
Investment Repairs	8	8	8	8	8	8	8	8	8	8	8	8	95
TOTAL CASH OVERHEAD COSTS	286	218	232	253	232	232	260	232	232	232	218	239	2,868
TOTAL CASH COSTS/ACRE	297	229	444	678	548	576	445	6,863	11,187	4,954	228	249	26,697

UC COOPERATIVE EXTENSION
Table 6. RANGING ANALYSIS
 CENTRAL COAST REGION - Santa Cruz and Monterey Counties 2005

COSTS PER ACRE AT VARYING YIELD TO PRODUCE RASPBERRIES

	YIELD (flats/acre)						
	1,500	2,000	2,500	3,000	3,500	4,000	4,500
OPERATING COSTS/ACRE:							
Cultural Cost	2,100	2,100	2,100	2,100	2,100	2,100	2,100
Harvest Cost (Pick, Haul)	9,911	12,883	15,855	18,828	21,800	24,773	27,745
Harvest Cost (Cool)	1,275	1,700	2,125	2,550	2,975	3,400	3,825
Interest on operating capital	214	260	305	351	396	442	487
TOTAL Operating Costs/Acre	13,500	16,943	20,385	23,829	27,271	30,715	34,157
TOTAL Operating Costs/Flat	9.00	8.47	8.15	7.94	7.79	7.68	7.59
CASH OVERHEAD COSTS/ACRE							
TOTAL Cash Costs/Acre	16,368	19,811	23,253	26,697	30,139	33,583	37,025
TOTAL Cash Costs/Flat	10.91	9.91	9.30	8.90	8.61	8.40	8.23
NON-CASH OVERHEAD COSTS/ACRE							
TOTAL Costs/Acre	20,290	23,733	27,175	30,619	34,061	37,505	40,947
TOTAL Costs/Flat	13.53	11.87	10.87	10.21	9.73	9.38	9.10

Flats = 7 lbs containing 12 one-half pint clamshells

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE (\$/flat)	YIELD (flats/acre)						
	1,500	2,000	2,500	3,000	3,500	4,000	4,500
Fresh							
8.00	-1,500	-943	-385	171	729	1,285	1,843
10.00	1,500	3,057	4,615	6,171	7,729	9,285	10,843
12.00	4,500	7,057	9,615	12,171	14,729	17,285	19,843
14.00	7,500	11,057	14,615	18,171	21,729	25,285	28,843
16.00	10,500	15,057	19,615	24,171	28,729	33,285	37,843
18.00	13,500	19,057	24,615	30,171	35,729	41,285	46,843
20.00	16,500	23,057	29,615	36,171	42,729	49,285	55,843

NET RETURNS PER ACRE ABOVE CASH COSTS

PRICE (\$/flat)	YIELD (flats/acre)						
	1,500	2,000	2,500	3,000	3,500	4,000	4,500
Fresh							
8.00	-4,368	-3,811	-3,253	-2,697	-2,139	-1,583	-1,025
10.00	-1,368	189	1,747	3,303	4,861	6,417	7,975
12.00	1,632	4,189	6,747	9,303	11,861	14,417	16,975
14.00	4,632	8,189	11,747	15,303	18,861	22,417	25,975
16.00	7,632	12,189	16,747	21,303	25,861	30,417	34,975
18.00	10,632	16,189	21,747	27,303	32,861	38,417	43,975
20.00	13,632	20,189	26,747	33,303	39,861	46,417	52,975

NET RETURNS PER ACRE ABOVE TOTAL COSTS

PRICE (\$/flat)	YIELD (flats/acre)						
	1,500	2,000	2,500	3,000	3,500	4,000	4,500
Fresh							
8.00	-8,290	-7,733	-7,175	-6,619	-6,061	-5,505	-4,947
10.00	-5,290	-3,733	-2,175	-619	939	2,495	4,053
12.00	-2,290	267	2,825	5,381	7,939	10,495	13,053
14.00	710	4,267	7,825	11,381	14,939	18,495	22,053
16.00	3,710	8,267	12,825	17,381	21,939	26,495	31,053
18.00	6,710	12,267	17,825	23,381	28,939	34,495	40,053
20.00	9,710	16,267	22,825	29,381	35,939	42,495	49,053

UC COOPERATIVE EXTENSION
Table 7. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, and BUSINESS OVERHEAD
 CENTRAL COAST REGION - Santa Cruz and Monterey Counties 2005

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
						Insur- ance	Taxes	
05	55 HP 2WD Tractor	32,269	12	8,068	3,373	139	202	3,714
05	75 HP 2WD Tractor	37,000	15	7,203	3,503	153	221	3,876
05	ATV 4WD	7,430	7	2,818	996	35	51	1,082
05	Disk - Harrow 5'	1,878	15	180	186	7	10	203
05	Pickup 1/2 ton	24,500	5	10,980	3,870	122	177	4,170
05	Truck 1-ton	36,000	5	20,000	5,001	193	280	5,475
05	Sprayer 300 gal	8,000	10	1,415	980	32	47	1,060
TOTAL		147,077		50,664	17,909	682	989	19,580
60% of New Cost *		88,246		30,398	10,746	409	593	11,748

*Used to reflect a mix of new and used equipment

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insur- ance	Taxes	Repairs	
Buildings	49,162	30		3,575	170	246	983	4,974
Raspberry Establishment (15 acres)	88,020	2		48,016	304	0	0	48,320
Irrigation (filtration system, 15 acres)	15,000	25		1,175	52	75	300	1,601
Irrigation Pump & Well	29,920	25		2,343	103	150	598	3,194
Sprinkler Pipe (for 5 acre sets)	6,000	10		816	21	30	120	986
Shop / Field Tools	12,600	15	1,260	1,244	48	69	252	1,613
Trellis (15 acres)	2,200	6		448	8	11	44	510
TOTAL INVESTMENT	202,902		1,260	57,616	704	581	2,297	61,198

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/		Price/ Unit	Total Cost
	Farm	Unit		
Food Safety Audit	27	acre	27.78	750
Land Rent (30 acres)	30	acre	2,000.00	60,000
Liability Insurance	27	acre	19.59	529
Office Expense	27	acre	300.00	8,100
Sanitation Fees	27	acre	114.00	3,078

UC COOPERATIVE EXTENSION
Table 8. HOURLY EQUIPMENT COSTS
 CENTRAL COAST REGION - Santa Cruz and Monterey Counties 2005

Yr	Description	COSTS PER HOUR							Total Costs/Hr.
		Actual Hours Used	Cash Overhead			Operating			
			Capital Recovery	Insur- ance	Taxes	Repairs	Fuel & Lube	Total Oper.	
05	55 HP 2WD Tractor	939	2.15	0.09	0.13	1.44	6.21	7.65	10.02
05	75 HP 2WD Tractor	803	2.62	0.11	0.17	1.60	8.47	10.07	12.97
05	ATV 4WD	286	2.09	0.07	0.11	0.55	1.73	2.28	4.55
05	Disk - Harrow 5'	133	0.84	0.03	0.05	0.29	0.00	0.29	1.21
05	Pickup 1/2 ton	130	17.86	0.56	0.82	1.17	4.60	5.77	25.01
05	Truck 1-ton	315	9.53	0.37	0.53	2.68	7.76	10.44	20.87
05	Sprayer 300 gal	86	6.82	0.23	0.33	1.10	0.00	1.10	8.48

UC COOPERATIVE EXTENSION

Table 9. COSTS AND RETURNS PER ACRE TWO YEAR SUMMARY
CENTRAL COAST - Santa Cruz and Monterey Counties 2005

	Establish	Year 1	Year 2	TOTAL
INCOME		36,000	36,000	72,000
Land Prep: Subsoil, Disk, Rototill	49		0	49
Fertilization	241	355	355	950
Fumigation	1,650		0	1,650
Shape Beds	14		0	14
Plant	1,516		0	1,516
Sprinklers Setup/Remove	76		0	76
Irrigation	73	603	603	1,280
Trellis Setup (labor only)	442		0	442
Drip System Setup	79		0	79
Shades Setup	30		0	30
Pollination		60	60	120
Weed Control		186	186	373
Insect Control		137	137	274
Disease Control		260	260	520
Pruning/Cleanup		259	259	518
PCA		100	100	200
ATV	8	16	16	40
Pickup	58	124	124	306
TOTAL CULTURAL	4,235	2,100	2,100	8,436
Harvest (piece rate)		18,209	18,209	36,417
Harvest: Haul Fruit		619	619	1,238
Harvest: Cool Fruit		2,550	2,550	5,100
TOTAL HARVEST COSTS	0	21,378	21,378	42,756
Interest on Operating Costs @ 7.65%	126	351	351	827
TOTAL OPERATING COSTS	4,361	23,829	23,829	52,019
NET RETURNS ABOVE OPERATING COSTS	-4,361	12,171	12,171	19,981
Cash Overhead:				
Liability Insurance	12	20	20	51
Office Expenses	176	300	300	776
Sanitation Facilities	67	114	114	295
Land Rent	1,176	2,222	2,222	5,620
Food Safety Audit	0	28	28	56
Property Taxes	16	41	41	97
Property Insurance	11	48	48	108
Investment Repairs	49	95	95	240
TOTAL CASH OVERHEAD	1,507	2,868	2,868	7,242
TOTAL CASH COST PER ACRE	5,868	26,697	26,697	59,261
NET RETURNS ABOVE CASH COSTS	-5,868	9,303	9,303	12,739
Non-Cash Overhead:				
Buildings	78	132	132	343
Trellis	0	30	30	60
Shop/Hand Tools	27	46	46	119
Sprinkler Pipe (5 acre sets)	18	30	30	78
Irrigation System (filtration)	26	78	78	182
Pump & Well	51	87	87	224
Equipment	67	317	317	701
TOTAL NON-CASH OVERHEAD COSTS	266	721	721	1,707
TOTAL COST PER ACRE	6,134	27,417	27,417	60,968
NET RETURNS ABOVE TOTAL COSTS	-6,134	8,583	8,583	11,032

UC COOPERATIVE EXTENSION
Table 10. OPERATIONS WITH EQUIPMENT - ESTABLISHMENT AND PRODUCTION
 CENTRAL COAST - Santa Cruz & Monterey Counties 2005

Operation	Operation Month	Tractor	Implement	Field Labor Hr/Acre	Material	Broadcast Rate/acre	Unit
Establishment:							
Fertilize: Soil Sample	August	ATV			Soil Analysis	0.07	acre
Land Prep: Subsoil	August	75HP 2WD	Chisel				
Land Prep: Disk 3X	August	75HP 2WD	Disk Offset 10'				
	September	75HP 2WD	Disk Offset 10'				
	September	75HP 2WD	Disk Offset 10'				
Land Prep: Rototill	August	75HP 2WD	Rototiller 5'				
Fertilize: Manure	August	75HP 2WD	Fertilizer Spreader		Manure	6.00	ton
Fertilize: 15-15-15	October	55HP 2WD	Fertilizer Spreader		15-15-15	400.00	lb
Disease: Fumigate	September	Custom					
Land Prep: List & Shape Beds	October	75HP 2WD	Disk Border 5'				
Plant:	November			12.00	Raspberries	2,900.00	each
Irrigate: Sprinkler Setup/Remove	November	55HP 2WD	Trailer	1.00	Setup		
	December	55HP 2WD	Trailer	1.00	Remove		
Irrigate: Sprinkle	November			1.00	Water	3.00	acin
Trellis: Install	March	55HP 2WD	Trailer	40.00			
Irrigate: Hang Drip Tape	March	55HP 2WD	Trailer	2.00	Drip Tape	4,400.00	ft
Shades: Set up	March			0.50	Shade Material		
Production:							
Pollinate	March	Custom			Hives	2.00	acre
Irrigate	March			1.25	Water	3.00	acin
	April			1.25	Water	3.00	acin
	May			1.25	Water	3.00	acin
	June			1.66	Water	4.00	acin
	July			1.67	Water	4.00	acin
	August			1.67	Water	4.00	acin
	September			1.25	Water	3.00	acin
Fertilize: through drip	March				15-10-30	85.72	lb
	April				15-10-30	85.72	lb
	May				15-10-30	85.72	lb
	June				15-10-30	85.71	lb
	July				15-10-30	85.71	lb
	August				15-10-30	85.71	lb
	September				15-10-30	85.71	lb
Fertilize: Leaf Sample	May	ATV			Analysis	0.07	each
Disease: Botrytis	April	55HP 2WD	Sprayer		Elevate	1.50	lb
	April	55HP 2WD	Sprayer		Elevate	1.50	lb
	June	55HP 2WD	Sprayer		Elevate	1.50	lb
Disease: Powdery Mildew	April	55HP 2WD	Sprayer		Sulfur	10.00	lb
	May	55HP 2WD	Sprayer		Sulfur	10.00	lb
	May	55HP 2WD	Sprayer		Sulfur	10.00	lb
	June	55HP 2WD	Sprayer		Sulfur	10.00	lb
Disease: Rust	May	55HP 2WD	Sprayer		Copper	5.00	lb
	June	55HP 2WD	Sprayer		Copper	5.00	lb
Insect: Mites	May	55HP 2WD	Sprayer		Savy	6.00	oz
Weed: Hand	May			9.00			
	June			9.00			

UC COOPERATIVE EXTENSION
Table 10. CONTINUED
 CENTRAL COAST - Santa Cruz & Monterey Counties 2005

Operation	Operation Month	Tractor	Implement	Field Labor Hr/Acre	Material	Broadcast Rate/acre	Unit
Harvest	August		Picking Buckets	Piece Rate 28.00	Flats	900.00	each
	September		Picking Buckets	Piece Rate 48.00	Flats	1,500.00	each
	October		Picking Buckets	Piece Rate 20.00	Flats	600.00	each
Haul	August	Truck 1 ton					
	September	Truck 1 ton					
	October	Truck 1 ton					
Cooling	August				Flats	900.00	each
	September				Flats	1,500.00	each
	October				Flats	600.00	each
Field Cleanup	October	75HP 2WD	Disk	24.00			