
UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

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**SAMPLE COSTS TO PRODUCE
FRESH MARKET BLUEBERRIES**



San Joaquin Valley South, Tulare County

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INTRODUCTION

The sample costs to produce blueberries in Tulare county under drip irrigation is 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 will 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, 2, 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 Economics, UC Davis, (530) 752-1515. Current studies may be downloaded from the department website <http://coststudies.ucdavis.edu> or obtained from county UC Cooperative Extension offices.

ASSUMPTIONS

The following assumptions refer to tables shown at the end of the report and pertain to sample costs to establish and produce blueberries in Tulare county. Practices described are not University of California recommendations, but represent production practices considered typical for blueberry production in the southern San Joaquin Valley region. The costs, practices, and materials will not be applicable to all situations every production year. Cultural practices, materials, and blueberry 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 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.*

Farm. The farm consists of 80 contiguous acres of land. Blueberries are being planted on 20 acres and tree fruit orchards occupy another 50 acres. Roads, irrigation system and farmstead account for the remaining ten acres. The owner farms the crop.

Establishment Cultural Practices and Material Inputs

Blueberries are a perennial crop that can produce for up to 25 years. In California it is not known for how long the available varieties may be in production since most of the blueberry plants are relatively new and still under evaluation. In this study we consider a series of expenditures associated with the establishment of the crop as well as an annual cost of production for a fully established crop. The establishment period goes from land preparation to the first harvest. Land preparation begins early in the summer and the first harvest occurs almost two years later during late spring. For practical purposes, the establishment period is defined as the first 24 months beginning with land preparation. Early in the first spring after planting, flower blooms are removed to promote growth. The first harvest yields a relatively small amount of fruit because plants are not yet mature. Plants are in full production four to six years after planting.

It is assumed that the only additional equipment the grower needs to purchase are part of the irrigation system and the 2,100-gallon storage tank that contains sulfuric acid. Land values in the region vary according to soil type, crop, and field size. For this study, bare land of fine sandy soil is valued at \$6,000 per acre.

Soil fumigation. The soil is fumigated with Telone for nematode control. This operation is done three to four months before planting. A contractor applies Telone on the row at a rate of 33.7 gallons/acre. The cost of this application was estimated at \$545.00 per acre.

Acidification. Blueberries are grown in soils with relatively low pH (5.0 with a variability of +/- 0.5), hence it is necessary to evaluate the initial soil pH and plan its adjustment by acidification. In the southern San Joaquin Valley adjustment is usually necessary since most soils have a pH between 6.7 and 7.0. In heavy-alkaline soils blueberry production is unfeasible. This budget does not include the cost of soil analysis but analysis should be done well ahead of the planting season since the acidification process could be slow. A contractor does the initial acidification three months before planting by spraying sulfuric acid on the entire field. Alternatively, it is possible to apply sulfur to the soil but this method works slower than sulfuric acid, and it won't work in soils with a pH greater than 6.0. Continuous monitoring of soil pH is necessary to avoid reducing the pH too much. With pH less than 4.0 plants growth will be affected. Irrigation water also needs to be acidified to a pH of 5.0. Irrigation water in Tulare County averages a pH of 7.7. Blueberries need 3 to 3.5 acre-feet of water per growing season. This means that 75 to 100 gallons a year of sulfuric acid are necessary to adequately reduce irrigation water pH. The grower owns a sulfuric acid pump and a 2,100-gallon tank for sulfuric acid storage. The grower also owns a water pH monitoring kit that uses on a regular basis to

control the amount of acid that needs to be applied through the irrigation system. The tank and the pH monitoring equipment are connected to the irrigation system.

Weeds. Pre-emergence herbicide (Round-up) is applied at 0.25 gallons/acre. Blueberries are poor competitors. Therefore, weed control is particularly important during the first two to three years. After planting, herbicides are applied with a boom sprayer on the edge of the rows and spot sprayed with a back-pack sprayer within rows.

Plowing, fertilization, bed shaping. After acidification, the field is plowed and disked, and beds are listed. 400 pound per acre of 15-15-15 fertilizer are applied after plowing, then incorporated into the soil with the disking operation. A border disk is used for beds preparation (36 to 48 inches wide by 12 to 18 inches high) before planting. In the first spring after planting, UN32 fertilizer is applied through the irrigation system at a rate of 40 pounds of nitrogen per acre. The following years the grower applies additional fertilizer through the drip system as detailed below (page 4).

Irrigation. Blueberries have a shallow root system (18 inches), making irrigation management crucial for a successful crop. Drip tape is laid down on the bed --and later covered by the mulch-- at two lines per bed, totaling 7,980 linear feet of hose/acre. Emitters on each line are 18 inches apart. Three men including the tractor driver, layout the drip system. The drip tape is trimmed, connected to the lateral lines, and tested for leaks. The farm has a well with a 40 HP electric pump. Water is pumped through a filtration station into main lines. The cost of pumping water and irrigation labor are included as cultural costs in Tables 1, 2, and 3. The most critical period for irrigation goes from fruit expansion (April) through harvest (June). Blueberries need between 3 and 3.5 acre-feet of water per growing season.

Plant Establishment. Planting season is fall. Blueberries are planted three feet apart within rows and 11 feet between rows. This results in 1,320 plants per acre. Three-year-old plants, 18 to 30 inches tall, are purchased in 1-gallon containers. The plants cost \$3.40/each for 1,000 plants minimum. Several varieties are available for planting in the region but for this study we selected *Misty*, combined on a 2:1 ratio with a pollinator variety. Two percent of the plants are replanted in the second year and included in the re-planting costs. For this study, trellising was not used.

During the first year after planting, by March, all blooms will be removed by hand to promote growth and plant vigor. The estimated operation time is one minute per plant, or 22 hours per acre.

Mulching. Various mulch materials are suitable for use in blueberries and research has not found significant differences among them. The final choice depends upon relative cost. For the region under study available materials are almond wood chips, pine shavings, and pistachio shells. If wood chips are used, pine or pine needles are preferred because of the low pH. Wood chips are spread over the beds immediately after planting at a rate of 195 cubic yards/acre to obtain a four-inch thick cover. Wood chips are used to minimize weed growth and to increase soil humidity. Some growers use black plastic to cover the wood chips (two millimeters thick by five feet wide, 3,630 linear feet per acre). The use of plastic demands more labor during planting, may result in increased weed problems around the crown of the bush, and increases the establishment cost (plastic costs \$182 per 2,500 linear feet). The plastic has to be replaced every four to five years. In this particular study mulching consists of wood-chips. Black plastic is not used. Mulch material should be partially replenished every other year.

Production Cultural Practice and Material Inputs

Weed control. In October, beginning the second year a mix of pre-emergence herbicides (Devrinol/Surflan mix) is applied to the whole area. In the spring, a five foot disc harrow is used to kill weeds between rows. Hoeing is done on a regular basis at about 18 hours per acre. Spot spraying may occasionally be necessary but it is not included here. Some growers prefer to plant cover crops between rows but this increases production costs. Weed control would be more intense were the grower to install a sprinkler irrigation system because it would promote weed growth. With a cover crop and a sprinkler irrigation system, mowing between rows would be necessary on a monthly basis from mid spring to mid fall (six to seven passes).

Plant replacement. In this study two percent of the plants need to be replaced at the beginning of the second year only.

Mulching. About 20% of the mulch material is replenished every other year. (Table 2 shows 10% of the volume as an annual average cost).

Pruning. Pruning is done twice a year: in the summer after harvest, and again in winter. The amount of labor required for pruning is associated with the variety planted. More dense vegetation varieties such as *Sharp-Blue* require more time. About 30% of the vegetation is removed. Large plants demand 3 minutes per plant (i.e. 65 hours/acre), while small or young plants are pruned in one minute each (22 hours/acre). The pruning includes removing "old" wood by the winter after the first harvest and then every winter.

Pests and diseases. Fungicide is applied once in February for Botrytis prevention (Rovral, 1.5 pints/acre). Two applications of Success are made in the summer for thrip control (6 fl.oz./acre each). Bird damage could be a serious issue compromising an entire crop if no control method is adopted. The method selected for this study consists of four propane cannons combined with flashing tapes and a person walking the field shooting a gun. Cannons need to be moved around to increase effectiveness.

Fertilization. Fertilizers are applied through the drip system at an annual rate of 100 pounds of nitrogen per acre, in three to four applications, from April to September.

Irrigation. Irrigation water is always acidified to the desired degree by adding sulfuric acid. Plants are irrigated an average of one and a half acre-inches per week during 28 weeks starting in the spring. During the summer, effective rainfall is negligible in the region and it is not taken into account. Total irrigation during the season is about 3.5 acre-feet.

Pollination. Bees are needed for pollination, at a rate of two hives per acre. Since blueberries and almonds bloom around the same time renting bees might be a problem in some areas. Bee hives are set up in winter and removed by the end of that season.

Harvest. For hand harvesting 10 to 15 people are needed per acre. Harvest season starts at the end of April to early May. Picking is done weekly until the end of June. The fruit is collected in 1-gallon plastic containers at a rate of 10 pounds per hour and is then brought to the

end of the row and dropped into plastic crates. These, in turn, are loaded onto a truck and delivered to the cooling and packing facility. Final packing is done into 12 one-pint plastic clam shells for a total of 11 pounds of fruit per flat. The grower pays \$0.85 per flat for cooling/packing services. While the plants are still young and yields are low, the pickers are paid by the hour, but in mature crops they get a piece rate that ranges from \$6 to \$12 per flat. This study assumes a cost of \$9.05 per hour in the first harvest, and \$7.50 per flat¹ for the mature crop harvest.

Yields and Returns. Blueberry production in California is a relatively new activity. The USDA does not keep track of blueberry production in California, nor does the County Agricultural Commissioner report contain data on blueberries. The North American Blueberry Council estimates in 800 thousand pounds the state's production in 2001. That volume represents less than one half of a one percent of total U.S. production. The state of Michigan is the main producer state accounting for 38.5 percent of the U.S. total. The state of Oregon, with 2,800 acres of blueberries and a production volume of 29.3 million pounds is the state with the highest yield (10.3 lb/acre).

Because blueberry production is a new activity in California recent market prices and production records do not reflect upcoming conditions. The blueberry acreage is increasing rapidly and most of the current fields have not reached maturity. Higher volumes and lower average prices might be expected in the coming years. For instance, in the state of Michigan the average price for fresh blueberries was \$0.97 per pound in 2001. For this study the price of blueberries was estimated at \$1.23 per pound². The estimated return provides a basis for a range of yields and prices shown in Table 7. This study assumes that the first harvest yields 2 pounds per plant, or 240 11-lb flats. Successive harvests may yield 10 to 20 pounds per plant (from 1,200 to 2,400 11-lb flats per acre).

Assessments. The grower pays \$12 per ton to the North American Blueberry Council for research and marketing.

Establishment and Production Costs

Labor. Hourly wages for workers are \$10.50 for machine operators, \$ 6.75 per hour for field labor. Adding 34% for the employer's share of federal and state payroll taxes, insurance, and other possible benefits gives the labor rates shown of \$14.07 per hour for machine labor, \$9.05 per hour for field labor. Labor for operations involving machinery are 20% higher than the operation time given in the Tables 1 and 2, to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and repair.

Equipment. Equipment costs are composed of three parts: non-cash overhead, cash overhead, and operating costs. Both of the overhead factors are discussed in the next sections. The operating costs consist of fuel, lubrication, and repairs. The fuel, lube, and repair cost per acre for each operation in Tables 1 and 2 is determined by multiplying the total hourly operating cost for each piece of equipment used for the cultural practice by the number of hours per acre for that operation. Tractor time is 10% higher than implement time (operation time) for a given operation to account for fueling, moving equipment, and setup time.

Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by the American Society of Agricultural Engineers (ASAE). Fuel

¹ Piece rate will be higher the first few weeks of the harvest season, and will tend to decrease later on.

² Prices are usually much higher during the early season, April-May. According to the USDA/NASS Non-Citrus Fruits Annual Report the US avg. price for 2001 fresh blueberries was \$1.23/lb. See <http://usda.mannlib.cornell.edu/reports/nassr/fruit/pnf-bb/ncit0702.pdf> , page 33.

and lubrication costs are also determined by ASAE equations based on maximum PTO horsepower, and type of fuel used. Prices for on-farm delivery of diesel and gasoline are \$1.40 and \$1.70 per gallon, respectively.

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 7.40% per year. A nominal interest rate is the typical market rate for borrowed funds. It is assumed the operating loan goes through harvest.

Risk. The risks associated with producing and marketing blueberries 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 of blueberry production.

Overhead Costs

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, office expense, liability and property insurance, sanitation services, and equipment repairs. Employee benefits, insurance, and payroll taxes are included in labor costs and not in overhead (see Labor).

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 varies depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.666% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$509 for the entire farm.

Office Expense. Office and business expenses are estimated at \$500 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, road maintenance, utilities, and miscellaneous expenses.

Sanitation Services. Sanitation services provide a double portable toilet and single toilet with washing equipment and cost the farm \$2,700 annually. The cost includes delivery and 12 months of weekly service for the double toilet.

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.

Farm equipment. Farm equipment on blueberry farms is purchased new or used; this 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 are shown in Table 4.

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 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 and purchase price for land are the same because land does not depreciate. The purchase price and salvage value for equipment and investments are shown in Table 4.

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 6.41% used to calculate capital recovery cost is the United States Department of Agriculture-Economic Reporting Service's (USDA-ERS) ten year average of California's agricultural sector real rate of return to production assets from current income. It is used to reflect the long-term realized rate of return to these specialized resources that can only be used effectively in the agricultural sector, not including inflation. In other words, the next best alternative use for these resources is in another agricultural enterprise.

Establishment costs. Costs to establish the blueberries are used to determine capital recovery expenses, depreciation and interests for the production years. Establishment cost is the sum of the costs of land preparation, blueberry plants, planting operation, cash overhead and production expenses net of revenues derived from the first harvest. In this case, the establishment costs apply to a period of 24 months. The accumulated net cash cost of \$11,602 shown in Table 1 is spread over the remaining 13 years of blueberry production.

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.

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

Northwest Berry & Grape Information Network. Oregon St. Univ. - University of Idaho - Washington St. Univ. "Blueberry Production Growing Guides". Downloaded March 7, 2002 from <http://berrygrape.orst.edu/fruitgrowing/berrycrops/blueberry.htm>

USDA/ERS. Farm Balance Sheet, California 1991-200. Downloaded on August 23, 2002, from <http://www.ers.usda.gov/Data/FarmBalanceSheet/fbsdmu.htm>

UC COOPERATIVE EXTENSION
Table 1. SAMPLE COSTS PER ACRE TO ESTABLISH BLUEBERRIES
 SAN JOAQUIN VALLEY SOUTH – Tulare County, 2002

	Costs per Acre	
	1 st Year	2 nd Year
Yield per acre (lb)	0	2,640
Planting Costs:		
Fumigate Soil	545	0
Pre-plant weed control	18	0
Pre-plant Acidification	316	0
Land Preparation -- Chisel 1x	3	0
Pre-plant fertilization	86	0
Land Preparation -- Disk 2x	9	0
Land Preparation -- Bed shape	11	0
Drip Irrigation System Setup	317	0
Pre-plant Irrigate	16	0
Plant Blueberries transplants	4,669	111
Wood-chips Mulch	1,475	0
TOTAL PLANTING COSTS	7,465	111
Cultural Costs:		
Irrigation + sulfuric acid	115	229
Bloom remove	199	0
Pruning	0	290
Pollination	0	50
Fertilization	16	29
Weed control	168	291
Thrip control	0	51
Disease control	0	37
Bird control	0	134
Use ATV	35	35
Use pick-up 1/2 ton	67	67
Use truck 2 ton	71	71
TOTAL CULTURAL COSTS	671	1,284
Harvest Costs:		
Hand harvest berries	0	2,389
Buckets	0	75
Cooling – Packing	0	204
Blueberry Council Fee	0	16
TOTAL HARVEST COSTS	0	2,684
Interest on operating capital @ 7.40%	450	682
TOTAL OPERATING COSTS/ACRE	8,586	4,762

Table 1 – Continued

CASH OVERHEAD:	1 st Year	2 nd Year
Liability insurance. (\$509 for entire farm of 80 acres)	7	7
Office expenses (\$500 per acre)	500	500
Sanitation facilities (\$2,700 for entire farm of 80 acres)	39	39
Property taxes (1%)	86	131
Property insurance (0.666%)	12	42
Investment repairs	68	71
TOTAL CASH OVERHEAD COSTS	712	789
TOTAL CASH COSTS/ACRE	9,298	5,551
GROSS INCOME (First Harvest)	0	3,247
ACCUMULATED NET CASH COST	9,298	11,602 (*)
NON-CASH OVERHEAD:		
Investment (Capital Recovery)		
Buildings	63	63
Sulfuric acid pump & tank	20	20
Shop & hand tools	25	25
Crates	0	32
Drip irrigation system	22	22
Well & pump	32	32
Land	440	440
Propane cannons	0	9
Equipment (60% of new cost)	168	123
TOTAL NON-CASH OVERHEAD COSTS	770	766
TOTAL COSTS/ACRE	10,068	6,317
INCOME ABOVE CASH COSTS	0	0
Accumulated total costs	10,068	16,385

(*): Accumulated cash cost net of first harvest income.

UC COOPERATIVE EXTENSION
Table 2 – COSTS PER ACRE TO PRODUCE BLUEBERRIES
 SAN JOAQUIN VALLEY SOUTH – Tulare County, 2002

Operation	Cash and Labor Costs per Acre						Your Cost
	Operation Time (Hrs/A)	Labor Cost	Fuel,Lube & Repairs	Material Cost	Custom/Rent	Total Cost	
Cultural:							
Irrigation	-	-	-	218	-	218	
Mulch, replenishment	1.00	35	6	87	-	128	
Fertilization	-	-	-	39	-	39	
Weed control	18.52	172	3	158	-	333	
Thrip control	0.92	15	7	79	-	101	
Pruning	87.00	787	-	-	-	787	
Disease control	0.46	8	3	26	-	37	
Pollination	-	-	-	-	50	50	
Bird control	4.00	36	-	97	-	134	
Use ATV	3.75	63	7	-	-	70	
Use pick-up 1/2 ton	5.83	98	35	-	-	133	
Use truck 2 ton	8.33	141	63	-	-	204	
TOTAL CULTURAL COSTS	129.81	1,356	124	725	50	2,234	
Harvest:							
Pick berries	-	13,500	-	25	-	13,525	
Packing, cooling	-	-	-	-	1,530	1,530	
N.A. Blueberry Council Fees	-	-	-	119	-	119	
TOTAL HARVEST COSTS	-	13,500	-	144	1,530	15,174	
Interest on operating capital @ 7.40%						239	
TOTAL OPERATING COSTS/ACRE		14,856	124	869	1,580	17,647	
CASH OVERHEAD:							
Liability insurance (\$509 for 70 producing acres)						7	
Office expenses						500	
Sanitation facilities (\$2,700 for 70 producing acres)						39	
Property taxes (1%)						143	
Property insurance (0.666%)						49	
Investment repairs						71	
TOTAL CASH OVERHEAD COSTS						809	
TOTAL CASH COSTS/ACRE						18,456	
NON-CASH OVERHEAD:							
Buildings						63	
Sulfuric acid pump & tank						19	
Shop & Hand Tools						18	
Crates						32	
Drip irrigation system						22	
Well & pump						32	
Land						440	
Blueberries establishment						1,342	
Propane cannons						9	
Equipment (60% of new cost)						123	
TOTAL NON-CASH OVERHEAD COSTS						2,100	
TOTAL COSTS/ACRE						20,556	

UC COOPERATIVE EXTENSION
Table 3 – COSTS AND RETURNS PER ACRE TO PRODUCE BLUEBERRIES
 SAN JOAQUIN VALLEY SOUTH – Tulare County, 2002

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Fresh Blueberry	19,800	lb	\$1.23	\$24,354	
OPERATING COSTS					
Custom:					
Hives-each	2	each	25	50	
Herbicide:					
Devrinol 2E	2	gal	55.29	111	
Surflan 4 AS	4	pt	11.98	48	
Fertilizer:					
UN-32	100	lb N	0.391	39	
Irrigation:					
Water - Pumped	42	acin	3.25	137	
Soil amendm.:					
Sulfuric acid	70	gal	1.16	81	
Mulch, woodchips	20	cuyd	4.33	87	
Insecticide:					
Success	12	floz	6.6	79	
Fungicide:					
Rovral	0.19	gal	137.84	26	
Bird ctrl:					
Propane gas tank	0.2	each	25	5	
Flash tape	17	each	4.75	81	
Bird bombs	30	each	0.39	12	
Harvest:					
Buckets	10	each	2.5	25	
Pick berries, a piece	1,800	flat	7.5	13,500	
Packing, cooling	1,800	flat	0.85	1,530	
N.A. Blueberry Council Fee	9.9	tons	12	119	
Labor (machine)	24.97	hrs	14.07	351	
Labor (non-machine)	111	hrs	9.05	1,005	
Fuel – Gas	35.82	gal	1.7	61	
Fuel – Diesel	8.6	gal	1.4	12	
Lube				11	
Machinery repair				41	
Interest on operating capital @ 7.40%				239	
TOTAL OPERATING COSTS/ACRE				17,647	
NET RETURNS ABOVE OPERATING COSTS				6,707	
TOTAL CASH OVERHEAD COSTS				809	
TOTAL NON-CASH OVERHEAD COSTS				2,100	
TOTAL COSTS/ACRE				20,511	
NET RETURNS ABOVE TOTAL COSTS				3,798	

UC COOPERATIVE EXTENSION
Table 4 – MONTHLY EXPENDITURES PER ACRE TO PRODUCE BLUEBERRIES
 SAN JOAQUIN VALLEY SOUTH – Tulare County, 2002

Beginning	JUL 01	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL		
Ending	JUN 02	01	01	01	01	01	01	02	02	02	02	02	02			
Cultural:																
Irrigation		37	37	37							35	35	35	218		
Fertilization		10	10	10									10	39		
Pruning		199					588							787		
Thrip ctrl		101												101		
Mulch replenishm.					128									128		
Weed control						163			54	54	62			334		
Fungicide									37					37		
Bee hives									50					50		
Bird control												134		134		
Use Pick-up 2 ton		17	17	17	17	17	17	17	17	17	17	17	17	204		
Use ATV		6	6	6	6	6	6	6	6	6	6	6	6	70		
Use Pick-up 1/2 ton		11	11	11	11	11	11	11	11	11	11	11	11	133		
TOTAL CULTURAL COSTS		381	81	81	162	197	622	34	176	88	132	203	79	2,235		
Harvest:																
Harvest													7,587	7,587	15,174	
TOTAL HARVEST COSTS														7,587	7,587	15,174
Interest on oper. capital		2	3	3	4	6	9	10	11	11	12	60	107	239		
TOTAL OPERATING COSTS/ACRE		384	84	84	166	202	632	44	186	99	144	7,850	7,773	17,648		
Overhead:																
Liability Insurance		1	1	1	1	1	1	1	1	1	1	1	1	7		
Office expenses		42	42	42	42	42	42	42	42	42	42	42	42	500		
Sanitation facilities		3	3	3	3	3	3	3	3	3	3	3	3	39		
Property Taxes								142						142		
Property Insurance								49						49		
Investment Repairs		6	6	6	6	6	6	6	6	6	6	6	6	71		
TOTAL CASH OVERHEAD COSTS		51	51	51	51	51	51	242	51	51	51	51	51	807		
TOTAL CASH COSTS/ACRE		435	135	136	218	254	683	285	238	151	195	7,901	7,825	18,455		

UC COOPERATIVE EXTENSION
**Table 5. BLUEBERRY PRODUCTION, WHOLE FARM ANNUAL EQUIPMENT,
 INVESTMENT, AND BUSINESS OVERHEAD**
 SAN JOAQUIN VALLEY SOUTH – Tulare County, 2002

ANNUAL EQUIPMENT COSTS							
Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
					Insur- ance	Taxes	
55HP 2WD Tractor	32,269	12	8,068	3,469	134	202	3,805
ATV 4WD	7,430	7	2,818	1,019	34	51	1,104
Disc harrow 5'	1,878	15	180	191	7	10	208
Sprayer 300 G	8,000	10	1,415	1,003	31	47	1,081
Pickup truck 1/2 ton	23,500	5	10,532	3,788	113	170	4,072
Truck 2 ton	27,380	5	12,271	4,413	132	198	4,744
Weed Sprayer 100 G	3,947	10	698	495	15	23	533
TOTAL	104,404		35,982	14,378	467	702	15,548
60% of New Cost (*)	62,642		21,589	8,627	280	421	9,329

(*) 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	20		4,430	164	246	983	5,822
Crates	9,400	5		2,256	31	47	-	2,335
Drip Irrigat. System	19,880	30		1,508	66	99	200	1,874
Establish. blueberries	232,040	13		26,843	773	1,160	-	28,776
Land	480,000	50	480,000	30,768	-	4,800	-	35,568
Propane cannons	1,720	15	165	175	6	9	60	251
Shop/Hand tools	12,637	15	1,264	1,284	46	70	253	1,652
Sulfuric acid pump	2,500	15		264	8	13	150	435
Sulfuric acid tank	1,200	15		127	4	6	25	162
Well & pump	27,200	25		2,211	91	136	2,720	5,158
TOTAL	835,739		482,598	69,866	1,189	6,586	4,391	82,033

ANNUAL BUSINESS OVERHEAD COSTS				
Description	Units/Farm	Unit	Price/Unit	Total Cost (Whole farm)
Liability Insurance	1	each	509	509
Office expenses	70	acre	500	35,000
Sanitation facilities	1	each	2700	2,700

**Table 6. UC COOPERATIVE EXTENSION
HOURLY EQUIPMENT COSTS
SAN JOAQUIN VALLEY SOUTH – Tulare County, 2002**

Description	Actual Hours Used	Cash Overhead			Operating Costs			Total Costs/Hr.
		Capital Recovery	Insur- ance	Taxes	Repairs	Fuel & Lube	Total Oper.	
55HP 2WD Tractor	963.7	2.16	0.08	0.13	1.43	4.35	5.78	8.15
ATV 4WD	275	2.22	0.07	0.11	0.55	1.3	1.85	4.26
Disc harrow 5'	126.9	0.9	0.03	0.05	0.29	0	0.29	1.27
Sprayer 300 G	137.5	4.38	0.14	0.21	1.1	0	1.1	5.82
Pickup truck 1/2 ton	391.7	5.8	0.17	0.26	1.74	4.19	5.93	12.17
Truck 2 ton	386.7	6.85	0.2	0.31	2.68	4.89	7.57	14.93
Weed sprayer 100 G	143.5	2.07	0.06	0.1	1.05	0	1.05	3.28

**Table 7. UC COOPERATIVE EXTENSION
RANGE ANALYSIS
SAN JOAQUIN VALLEY SOUTH – Tulare County, 2002**

NET RETURNS PER ACRE ABOVE OPERATING COSTS OF PRODUCTION							
Price \$/lb	Yield (lb/acre)						
	13,200	15,400	17,600	19,800	22,000	24,200	26,400
0.86	(1,162)	(966)	(770)	(575)	(379)	(183)	12
0.98	422	882	1,342	1,801	2,261	2,721	3,180
1.11	2,138	2,884	3,630	4,375	5,121	5,867	6,612
1.23	3,722	4,732	5,742	6,751	7,761	8,771	9,780
1.35	5,306	6,580	7,854	9,127	10,401	11,675	12,948
1.48	7,022	8,582	10,142	11,701	13,261	14,821	16,380
1.60	8,606	10,430	12,254	14,077	15,901	17,725	19,548

NET RETURNS PER ACRE ABOVE CASH COSTS OF PRODUCTION							
Price \$/lb	Yield (lb/acre)						
	13,200	15,400	17,600	19,800	22,000	24,200	26,400
0.86	(1,969)	(1,773)	(1,578)	(1,382)	(1,186)	(991)	(795)
0.98	(385)	75	534	994	1,454	1,913	2,373
1.11	1,331	2,077	2,822	3,568	4,314	5,059	5,805
1.23	2,915	3,925	4,934	5,944	6,954	7,963	8,973
1.35	4,499	5,773	7,046	8,320	9,594	10,867	12,141
1.48	6,215	7,775	9,334	10,894	12,454	14,013	15,573
1.60	7,799	9,623	11,446	13,270	15,094	16,917	18,741

NET RETURNS PER ACRE ABOVE TOTAL COSTS OF PRODUCTION							
Price \$/lb	Yield (lb/acre)						
	13,200	15,400	17,600	19,800	22,000	24,200	26,400
0.86	(4,058)	(3,863)	(3,667)	(3,471)	(3,276)	(3,080)	(2,884)
0.98	(2,474)	(2,015)	(1,555)	(1,095)	(636)	(176)	284
1.11	(758)	(13)	733	1,479	2,224	2,970	3,716
1.23	826	1,835	2,845	3,855	4,864	5,874	6,884
1.35	2,410	3,683	4,957	6,231	7,504	8,778	10,052
1.48	4,126	5,685	7,245	8,805	10,364	11,924	13,484
1.60	5,710	7,533	9,357	11,181	13,004	14,828	16,652

Note: Numbers in parenthesis mean a net loss for the given price and yield combination.