
UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2007

SAMPLE COSTS TO PRODUCE
FRESH MARKET
TOMATOES



SAN JOAQUIN VALLEY

Furrow Irrigated

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San Joaquin Valley - 2007

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Sample costs to produce fresh market tomatoes in the San Joaquin Valley are presented in this study. This study is intended as a guide only, and can be used to make production decisions, determine potential returns, prepare budgets and evaluate production loans. Practices described are based on those production practices considered typical for the crop and area, but will not apply to every farm. Sample costs for labor, materials, equipment and custom services are based on current figures. A blank column, “*Your Costs*”, in Tables 1 and 2 is provided to enter your farming costs.

The hypothetical farm operation, production practices, overhead, and calculations are described under the assumptions. For additional information or an explanation of the calculations used in the study call the Department of Agricultural and Resource Economics, University of California, Davis, (530) 752-3589 or your local UC Cooperative Extension office.

Sample Cost of Production Studies are available for many commodities. All current and some archived studies can be downloaded from the Agricultural and Resource Economics website at UC Davis <http://coststudies.ucdavis.edu>. These studies as well as other archived studies not on the website can be requested through the department by calling (530) 752-1517.

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ASSUMPTIONS

The following assumptions refer to Tables 1 to 7 and pertain to sample costs to produce fresh market tomatoes in the San Joaquin Valley. The cultural practices described represent production operations and materials considered typical for a well managed farm in the region. Costs, materials, and practices in this study will not apply to all farms. Timing and types of cultural practices will vary among growers within the region and from season to season due to variables such as weather, soil, insect and disease pressure. This cost study is intended as a guide only. For more information on California fresh market tomato production visit the UC Vegetable Research and Information Center website at www.vric.ucdavis.edu. **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 cost study is based on a hypothetical non-contiguous 1,200 acre farm of which 150 rented acres are planted to fresh market tomatoes. Other crops grown on the farm are almonds and crops in rotation with tomatoes may include small grains, cotton, corn, cantaloupes, peppers, green and dry beans. The rented land includes developed wells and irrigation system. All costs for the land and the irrigation system including property taxes are incurred by the landowner.

Cultural Practices and Material Inputs

Land Preparation. Primary tillage is done in the fall (November in this study) preceding planting. Tillage operations consist of disking twice, chiseling twice, triplaning twice, spreading a soil amendment, disking, listing beds, shaping beds and applying herbicide. When an operation is done twice, it is usually in two different directions. The crop year in this study begins with land preparation in November and continues through harvest.

Planting. No specific fresh market variety is planted in this study, except that the data is based on early to midseason plantings and harvest. Beds on five-foot centers are made in the fall with a three-row lister and shaped with a bed-shaper. In the spring, the beds are cultivated with a rolling cultivator to mulch the surface. The seedlings (transplants) are grown by a commercial greenhouse from seed supplied by the grower. The cost for both the seed and seedlings are included in the planting costs. Seedlings (transplants) are planted from mid-February through July using a three-row transplanter. A mid-April planting date is used in this report. The plants are spaced 16 inches apart in a single row on 60 inch beds, for a total of 6,550 plants per acre. The planting crew uses one tractor driver, six persons on the transplanter, one water truck driver, and one additional person for miscellaneous work.

Nutrition. In the fall during land preparation, one to two tons of gypsum or lime is applied to the field. Two tons of gypsum are applied in this study. Nitrogen (N), phosphorus (as P_2O_5) and potassium (as K_2O) plus zinc are supplied from a complete liquid fertilizer blend, 8-8-8, preplant incorporated at 1,000 pounds per acre into the bed below the planting line. Fertilizer as 10-34-0 at 3.5 gallons (41.3 pounds) per acre, zinc at 0.50 gallon and humic acid at 1 gallon per acre are added to the transplant water for a total of 5 gallons of material. Seventy pounds of N as UN-32 are sidedressed in May. Ten pounds of N per acre from CAN17 are applied in the irrigation water (water-run N) in June, giving a total of 164 pounds of N for the season from all nitrogen fertilizers applied.

Fertilizer Analysis. Soil samples are taken in the fall prior to land preparation and tissue samples are taken once in early June by the PCA or as a custom service by a commercial lab. For each collection, one sample per 20 acres is taken. Costs shown are for the lab analysis (\$2) and for collection by the PCA (\$2).

Irrigation. Furrow irrigation using siphon tubes are used for this study. The irrigation water is supplied by the local irrigation district at \$40 per acre foot (\$3.33 per acre inch) plus \$20 per acre stand-by charge and other administrative costs (paid by landlord). The first irrigation occurs in April shortly after planting, followed by subsequent irrigations at 8 to 12 day intervals depending on the weather in May, June and early July. A total of 36 acre-inches are applied to the crop.

Pest Management. The pesticides and rates mentioned in this cost study are listed in *Integrated Pest Management for Tomatoes* and *UC Pest Management Guidelines, Tomato*. For more information on pest identification, monitoring, and management visit the UC IPM website at www.ipm.ucdavis.edu. For information and pesticide use permits, contact the local county Agricultural Commissioner's office. Adjuvants or surfactants may be recommended for use with some pesticides, but are not included in this study. Pesticide costs vary by location and grower volume. Pesticide costs in this study are taken from a single dealer and shown as full retail.

All tomato fields will experience some pest incidence, but the specific pests and management will vary between fields due to planting date, location, microclimate, and pest pressure. Integrated pest management is used to control weeds, insects, diseases, and related pests. Controls in this study are based on early to midseason plantings.

Pest Control Adviser (PCA). The PCA or crop consultant monitors the field for agronomic problems including pests and nutrition and writes pesticide recommendations. Growers may hire private PCAs or receive the service as part of a service agreement with an agricultural chemical and fertilizer company. An independent PCA is assumed for this study, with a seasonal rate of \$20 per acre plus additional charges for collecting soil and tissue samples.

Weeds. The most troublesome weeds in tomatoes are field bindweed, nightshade, nutsedge, purslane, and occasionally dodder. Treflan is applied to the beds in the fall during listing and Roundup is applied to the fallow beds in March. Prior to transplanting in the spring, Treflan and Dual are applied and incorporated into the beds. Dual is also applied at layby in June. Weed control also includes hand hoeing prior to layby (June) and three mechanical cultivations – one in April prior to planting to breakup the surface and two after planting (May, June).

Insects. General foliage and fruit feeders are tomato fruitworms, various armyworms, leafminers, russet mites, stink bugs, thrips, and potato aphids. Beet leafhoppers and pinworms are an occasional problem. In this study beet leafhoppers (*Circulifer tenellus*) and thrips (various species), consperse stink bug (*Euschistus conspersus*), russet mite (*Aculops lycopersici*), and armyworm (*Spodoptera spp.*) are the target pests. The insects and mites are controlled with three ground applications of insecticides. The first application is at or within a few weeks of planting (April); the second is 4-5 weeks after planting (May); and the third is at layby in June. The first application is a transplant water drench or sidedress of Admire Pro for thrips and leafhoppers. The russet mites, stinkbugs, and worms are managed with two tank mix applications. The first application contains Kelthane for russet mite and Asana for stink bug. The second application contains Asana, Agri-Mek, and Avaunt for stinkbug, russet mite and armyworms.

Disease. Although there are many diseases affecting tomatoes, incidence is usually patchy and left untreated. However, early to midseason plantings may require copper protectant applications for bacterial speck or fungicide protection from late blight, while mid to late season plantings may require fungicide applications to prevent or minimize damage from powdery mildew, late blight, and black mold. Bacterial speck (*Pseudomonas syringae* pv. *tomato*) in this study is prevented with two ground applications of Kocide (copper)

and Dithane fungicide in late April and early May. Tomato spotted wilt, a viral disease transmitted by thrips, has been increasing in tomatoes in the San Joaquin Valley and for that reason thrips control is included under insect management costs.

Harvest. The tomato crop is hand harvested 80 to 110 days after transplanting (mid to late July in this study) by contract labor. Tomatoes are picked and hauled from the field to the packing shed. A tractor pulls a flatbed trailer with a gondola through the field, one trailer per 35 to 40 persons picking crew, one-half the crew working on each side of the trailer. Each picker has two 5-gallon buckets holding about 35 pounds of fruit. The picker takes about 2 to 2.5 minutes to fill two buckets, go to the trailer, hand buckets to dumper, record dump with checker and return to picking. One dumper is on each side of the trailer to dump the buckets and one checker stands at the end of the trailer to record picker's dumps. Custom harvesting of the tomatoes costs \$62 per gross ton plus \$12 per gross ton to haul the tomatoes to the packing shed for a total of \$74 per gross ton.

Yields. Gross crop yields range from 12 to 25 tons per acre in the San Joaquin Valley. The average packout rate ranges from 60-75 percent, netting 8-18 tons per acre of marketable fruit. In general early to mid-season tomatoes (transplanted February – May) have higher yields than late season tomatoes (June – July transplant dates). This study assumes a gross yield of 18 tons and a packout rate of 72% netting 13 tons or 1,040 packed 25 pound boxes. The \$74 picking and hauling cost per gross ton equates to \$1.28 per packed box.

Packing. Packing fees vary between sheds and include the costs of packing labor, packaging materials such as cartons and pallets, selling fees, and miscellaneous costs. This study uses a packing fee of \$2.50 per 25 pound box. The total harvest and packing cost is \$3.78 per packed box.

Returns. Growers may produce some tomatoes under contract, but most are sold on the open market and prices will vary. Differences in fresh market tomato prices and yields can be substantial over the season. Average prices for San Joaquin Valley growers for 2002 to 2006 (County Ag Commissioner Reports) are \$6.38 per box ranging from \$4.85 to \$7.69. Due to the market fluctuation of prices received by growers, an assumed return price rounded to \$6.50 per box is used in this study based on the 2005 to 2006 average. Table 4, Ranging Analysis, shows the net returns above operating costs, cash costs and total costs for various price and yield levels.

Assessments. Tomato growers are assessed a fee for the Curly Top Virus Control Program (CTVCP) administered by the California Department of Food and Agriculture (CDFA). Growers in District II pay \$0.127 per net ton. District II includes San Joaquin Valley counties from Merced to Kern.

Field Cleanup. After harvest, the crop residue is mulched with a flail-type mower, then disked in two passes with a stubble disk.

Truck/Pickup. General pickup use is listed as a separate line item. A water truck is used during the season to water the roads usually daily and twice a day during the harvest season. The mileage and times are estimated and not taken from any specific data.

Labor, Equipment, and Interest Costs

Labor. Labor rates of \$13.50 per hour for machine operators and \$10.80 for general labor includes payroll overhead of 35%. The basic hourly wages are \$10.00 for machine operators and \$8.00 for general labor. The overhead includes the employers' share of federal and California state payroll taxes, workers' compensation insurance for truck crops (code 0172), and a percentage for other possible benefits. Workers' compensation

costs will vary among growers, but for this study the cost is based upon the average industry final rate as of January 1, 2007 (personal email from California Department of Insurance, May 18, 2007, unreferenced). Labor for operations involving machinery are 20% higher than the operation time given in Table 1 to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and field repair.

Equipment Operating Costs. Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by 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 \$2.30 and \$2.80 per gallon, respectively. Fuel costs are derived from American Automobile Association (AAA) and Energy Information Administration 2006 monthly data. The cost includes 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 1 are determined by multiplying the total hourly operating cost in Table 6 for each piece of equipment used for the selected operation by the hours per acre. Tractor time is 10% higher than implement time for a given operation to account for setup, travel and down time.

Interest on Operating Capital. Interest on operating capital is based on cash operating costs and is calculated monthly until harvest at a nominal rate of 10.00% 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 January 2007.

Risk. Perishability of fresh vegetables diminishes the opportunity to wait for a better market and price. Because of the risk involved, access to a market is crucial. A market channel should be determined before any tomato production begins. Fresh market vegetables are a high risk enterprise because the market for fresh vegetables is volatile for both price and quantity. Risk is caused by uncontrollable factors such as a decrease in the demand, an oversupply, weather causing planting and harvesting delays, and diseases and insects which may lower quality.

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, and investment repairs.

Property Taxes. Counties charge a base property tax rate of 1% on the assessed value of the property. In some counties special assessment districts exist and charge additional taxes on property including equipment, buildings, and improvements. For this study, county taxes are calculated as 1% of the average value of the property. Average value equals new cost plus salvage value divided by two on a per acre basis.

Insurance. Insurance for farm investments vary depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.714% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$1,296 for the entire farm.

Office Expense. Office and business expenses are estimated at \$75 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, and legal fees for whole farm. The cost is a general estimate and not based on any actual data.

Land Rent. Land rents for the eight counties in the San Joaquin Valley depend on the irrigation district (2007 Trends and Leases) and ranged from \$100 to \$350 per acre. Land rents according to growers in the area ranged from \$225 to \$250 per acre. For this study, \$250 is the rental value and the landowner pays the basic monthly water service charge (standby and administrative charges) and the grower pays the cost for the water used.

Sanitation Rental. The cost includes double unit toilets with washbasins, delivered and serviced weekly. The double toilets with hand washing facilities are rented for five months of weekly service beginning in mid March. The number of toilets required depends upon crew size.

Environmental Fees. Growers are assessed various fees by government agencies to protect the environment. Examples of some fees are water quality, air quality, pesticide permits, etc. Some are charged per farm or grower and some by the acre. For example an air quality permit costs \$75 to \$150 per grower, whereas growers must belong to a water coalition for surface water monitoring that cost \$5 per acre. For this study a fee is estimated based on some available data as reported by the growers plus some charges not currently known.

Non-Cash Overhead

Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments.

Capital Recovery Costs. Capital recovery cost is the annual depreciation and interest costs for a capital investment. It is the amount of money required each year to recover the difference between the purchase price and salvage value (unrecovered capital). 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 wearout life, as given by ASAE by the annual hours of use in this operation. For other investments including irrigation systems, buildings, and miscellaneous equipment, the value at the end of its useful life is zero. The salvage value for land is the purchase price because land does not depreciate. The purchase price and salvage value for equipment and investments are shown in Table 5.

Capital Recovery Factor. Capital recovery factor is the amortization factor or annual payment whose present value at compound interest is 1. The amortization factor is a table value that corresponds to the interest rate used and the life of the machine.

Interest Rate. An interest rate of 7.25% is used to calculate capital recovery. The rate will vary depending upon loan amount and other lending agency conditions, but is the basic suggested rate by a farm lending agency as of January 2007.

Building. The metal building(s) are on a cement slab and total approximately 2,400 square feet. The buildings are used for shops and equipment storage.

Fuel Tanks. Two 350 gallon fuel tanks are on metal stands in cement containment meeting federal and state regulations.

Shop/Field Tools. Includes shop equipment and tools and small tools and/or small hand equipment used in the field.

Siphon Tubes. The grower owns 300 two-inch siphon tubes used mainly on the tomatoes.

Equipment. Farm equipment is purchased new or used, but the study shows the current purchase price for new equipment. The new purchase price is adjusted to 60% to indicate a mix of new and used equipment. Annual ownership costs for equipment and other investments are shown in Table 6. 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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Table 1. COSTS PER ACRE TO PRODUCE FRESH MARKET TOMATOES

SAN JOAQUIN VALLEY – 2007

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per Acre					Your Cost
		Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent	Total Cost	
Cultural:							
Nutrition: Soil Sampling (PCA, analysis)	0.00	0	0	0	4	4	
Land Prep: Stubble Disk 2X	0.30	5	12	0	0	17	
Land Prep: Chisel 2X	0.60	10	25	0	0	34	
Land Prep: Triplane 2X	0.24	4	10	0	0	14	
Nutrition: Soil Amendments (gypsum)	0.22	4	6	84	0	94	
Land Prep: Disk	0.10	2	4	0	0	6	
Land Prep/Weed: List Beds/Spray Treflan	0.20	3	8	3	0	14	
Land Prep: Shape Beds/Incorporate Treflan	0.25	4	10	0	0	14	
Weed: Spray Beds (Roundup)	0.10	2	3	24	0	29	
Weed: Cultivate (break up surface)	0.14	2	2	0	0	5	
Nutrition: Shank Fertilizer (8-8-8+Zn)	0.22	4	7	70	0	80	
Weed: Spray & Incorporate herbicide (Treflan, Dual)	0.25	4	8	23	0	36	
Plant: Transplant. Fertilize (10-34-0+Zn+Humic). Insect: Thrips, Leafhoppers (Admire)	0.33	38	9	464	0	511	
Irrigate: Make Ditches	0.06	1	2	0	0	3	
Irrigate: (water & labor)	3.50	38	0	120	0	158	
Disease: Speck (Kocide, Dithane) 2X	0.20	3	6	26	0	35	
Irrigate: Close Ditch & Drag	0.06	1	2	0	0	3	
Weed: Cultivate	0.55	9	10	0	0	19	
Weed: Hand Hoe	0.00	0	0	0	70	70	
Insect: Stinkbug, Mites (Asana, Kelthane)	0.10	2	3	16	0	20	
Nutrition: Fertilize Sidedress (UN32)	0.22	4	7	32	0	43	
Nutrition: Tissue (leaf) Sampling	0.00	0	0	0	4	4	
Insect: Stinkbug, Mites, Worms (Asana AgriMek Avaunt)	0.10	2	3	127	0	132	
Weed: Layby (Dual)	0.14	2	3	20	0	25	
Nutrition: Fertilize Waterrun (CAN 17)	0.00	0	0	8	0	8	
Pest Control Adviser	0.00	0	0	0	20	20	
Water Truck	0.08	1	1	0	0	2	
Pickup	0.83	14	8	0	0	22	
Clean Up: Mow/Shred plants (post harvest)	0.14	2	5	0	0	7	
Clean Up: Disk crop residue (post harvest)	0.29	5	11	0	0	16	
TOTAL CULTURAL COSTS	9.25	163	164	1,017	98	1,443	
Harvest:							
Field Pick	0.00	0	0	0	1,116	1,116	
Haul To Shed	0.00	0	0	0	216	216	
Box, Pack & Sell	0.00	0	0	0	2,600	2,600	
Assessment:	0.00	0	0	2	0	2	
TOTAL HARVEST COSTS	0.00	0	0	2	3,932	3,934	
Interest on operating capital @ 10.00%						82	
TOTAL OPERATING COSTS/ACRE		163	164	1,019	4,030	5,458	

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Table 1. Continued

SAN JOAQUIN VALLEY –2007

Operation	Operation	Cash and Labor Costs per Acre				Total Cost	Your Cost
	Time (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent		
CASH OVERHEAD:							
Liability Insurance						1	
Office Expense						75	
Rent - Tomato Land						250	
Sanitation (Portable Washing & Toilets)						8	
Environmental Fees						10	
Property Taxes						4	
Property Insurance						3	
Investment Repairs						2	
TOTAL CASH OVERHEAD COSTS						352	
TOTAL CASH COSTS/ACRE						5,810	
NON-CASH OVERHEAD (Capital Recovery):							
	Per producing	Annual Costs					
	Acre	Capital Recovery					
Buildings, 2400 sqft	63	5				5	
Tools: Shop/Field	13	1				1	
Fuel Tanks	3	0				0	
Siphon Tubes	28	7				7	
Equipment	500	65				65	
TOTAL NON-CASH OVERHEAD COSTS						79	
TOTAL COSTS/ACRE						5,889	
TOTAL COST/BOX						5.66	

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Table 2. COSTS and RETURNS PER ACRE to PRODUCE FRESH MARKET TOMATOES
 SAN JOAQUIN VALLEY - 2007

	Quantity Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Tomatoes Fresh Market	1,040.00	box-25 lb	6.50	6,760	
TOTAL GROSS RETURNS				6,760	
OPERATING COSTS					
Custom/Contract:					
Soil Analysis	0.05	each	40.00	2	
Tissue Analysis	0.05	each	40.00	2	
Pick Tomatoes	18.00	ton	62.00	1,116	
Haul Tomatoes	18.00	ton	12.00	216	
Pack Tomatoes	1,040.00	box	2.50	2,600	
Hand Weed (hoe)	1.00	acre	70.00	70	
Pest Control Adviser (collect soil & tissue samples)	0.10	each	40.00	4	
Pest Control Adviser (PCA)	1.00	acre	20.00	20	
Fertilizer/Soil Amendments:					
Gypsum	2.00	ton	42.00	84	
8-8-8	1,000.00	lb	0.06	60	
Zinc Chelate 6% (9.21 lbs/gal)	10.00	lb	1.00	10	
10-34-00	41.30	lb	0.16	7	
Zinc (% unknown) Western Farm	0.50	gal	14.00	7	
Humic Acid	1.00	gal	9.00	9	
UN32	70.00	lb N	0.46	32	
CAN 17 (17-0-0)	10.00	lb N	0.78	8	
Herbicide:					
Triflurex HFP	2.00	pint	2.97	6	
Roundup Ultra Max	3.00	pint	8.00	24	
Dual II Magnum	2.00	pint	20.15	40	
Seed:					
Tomato Seed	6.55	thou	22.00	144	
Tomato Transplants	6.55	thou	28.00	183	
Irrigation:					
Water	36.00	acin	3.33	120	
Fungicide:					
Kocide DF	4.00	lb	2.55	10	
Dithane DF Rainshield	4.00	lb	3.89	16	
Insecticide:					
Admire Pro	10.00	floz	11.40	114	
Asana XL	16.00	floz	1.08	17	
Kelthane MF	1.00	pint	7.29	7	
Agri-Mek 0.15EC	12.00	floz	7.82	94	
Avaunt	3.50	oz	7.05	25	
Assessment:					
CDFA-Curly Top Virus Program	13.00	ton	0.13	2	

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Table 2. CONTINUED
SAN JOAQUIN VALLEY - 2007

	Quantity		Price or	Value or	Your
	Acre	Unit	Cost/Unit	Cost/Acre	Cost
Labor (machine)	6.90	hrs	13.50	93	
Labor (non-machine)	6.50	hrs	10.80	70	
Fuel - Gas	2.08	gal	2.80	6	
Fuel - Diesel	45.90	gal	2.30	106	
Lube				17	
Machinery repair				36	
Interest on operating capital @ 10.00%				82	
TOTAL OPERATING COSTS/ACRE				5,458	
NET RETURNS ABOVE OPERATING COSTS				1,302	
CASH OVERHEAD COSTS:					
Liability Insurance				1	
Office Expense				75	
Rent - Tomato Land				250	
Sanitation (Portable Washing & Toilets)				8	
Environmental Fees				10	
Property Taxes				4	
Property Insurance				3	
Investment Repairs				2	
TOTAL CASH OVERHEAD COSTS/ACRE				352	
TOTAL CASH COSTS/ACRE				5,810	
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Buildings, 2400 sqft				5	
Tools: Shop/Field				1	
Fuel Tanks				0	
Siphon Tubes				7	
Equipment				65	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				79	
TOTAL COSTS/ACRE				5,889	
NET RETURNS/ ACRE				871	

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION
Table 3. MONTHLY CASH COSTS PER ACRE TO PRODUCE FRESH MARKET TOMATOES
 SAN JOAQUIN VALLEY –2007

Beginning NOV 06 Ending OCT 07	NOV 06	DEC 06	JAN 07	FEB 07	MAR 07	APR 07	MAY 07	JUN 07	JUL 07	AUG 07	SEP 07	OCT 07	TOTAL
Cultural:													
Nutrition: Soil Sampling	4												4
Land Prep: Stubble Disk 2X	17												17
Land Prep: Chisel 2X	34												34
Land Prep: Triplane 2X	14												14
Nutrition: Soil Amendments (gypsum)	94												94
Land Prep: Disk	6												6
Land Prep/Weed: List Beds/Spray Treflan	14												14
Land Prep: Shape Beds/Incorporate Treflan		14											14
Weed: Spray Beds (Roundup)					29								29
Weed: Cultivate (break up surface)						5							5
Nutrition: Shank Fertilizer (8-8-8+Zn)						80							80
Weed: Spray & Incorporate herbicide (Treflan, Dual)						36							36
Plant/Nutrition: Transplant/Fertilize (10-34-0+Zn+Humic). Insect: Thrips, Leafhoppers (Admire)						511							511
Irrigate: Make Ditches						1		2					3
Irrigate: (water & labor)						23	45	68	23				158
Disease: Speck (Kocide, Dithane) 2X						17	17						35
Irrigate: Close Ditch & Drag							1	1	1				3
Weed: Cultivate							9	9					19
Weed: Hand Hoe							70						70
Insect: Stinkbug, Mites (Asana, Kelthane)							20						20
Nutrition: Fertilize Sidedress (UN32)							43						43
Nutrition: Tissue (leaf) Sampling								4					4
Insect: Stinkbug, Mites, Worms (Asana AgriMek Avaunt)								132					132
Weed: Layby (Dual)								25					25
Nutrition: Fertilize Waterrun (CAN 17)								8					8
Pest Control Adviser (PCA)	2	2	2	2	2	2	2	2	2	2			20
Water Truck	0	0	0	0	0	0	0	0	0	0			2
Pickup	2	2	2	2	2	2	2	2	2	2			22
Clean Up: Chop/Mulch plants (post harvest)											7		7
Clean Up: Disk crop residue (post harvest)											16		16
TOTAL CULTURAL COSTS	188	19	4	4	33	677	210	253	28	27	0	0	1,443

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

Table 3. continued
SAN JOAQUIN VALLEY – 2007

Beginning NOV 06	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	TOTAL
Ending OCT 07	06	06	07	07	07	07	07	07	07	07	07	07	
Harvest:													
Field Pick									1,116				1,116
Haul To Shed									216				216
Box, Pack & Sell									2,600				2,600
Assessment:										2			2
TOTAL HARVEST COSTS									3,932	2			3,934
Interest on operating capital @ 10.00%	2	2	2	2	2	8	9	12	45	0			82
TOTAL OPERATING COSTS/ACRE	190	20	6	6	35	684	220	264	4,004	29	0	0	5,458
OVERHEAD:													
Liability Insurance				1									1
Office Expense	8	8	8	8	8	8	8	8	8	8			75
Rent - Tomato Land												250	250
Sanitation (Portable Washing & Toilets)					1	2	2	2	2	1			8
Environmental Fees								10					10
Property Taxes			2						2				4
Property Insurance			1						1				3
Investment Repairs	0	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL CASH OVERHEAD COSTS	8	8	11	9	8	9	9	19	12	8	0	250	352
TOTAL CASH COSTS/ACRE	197	28	17	15	43	693	229	283	4,017	37	0	250	5,810

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

Table 4. RANGING ANALYSIS
SAN JOAQUIN VALLEY - 2007

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE FRESH MARKET TOMATOES

	*YIELD (BOX/ACRE)						
	920	960	1,000	1,040	1,080	1,120	1,160
OPERATING COSTS/ACRE:							
Cultural Cost	1,443	1,443	1,443	1,443	1,443	1,443	1,443
Harvest (pick)	987	1,030	1,073	1,116	1,159	1,202	1,245
Haul	191	199	208	216	224	233	241
Pack	2,300	2,400	2,500	2,600	2,700	2,800	2,900
Assessment	1	2	2	2	2	2	2
Interest on operating capital @ 10.00%	78	79	81	82	83	84	86
TOTAL OPERATING COSTS/ACRE	5,000	5,153	5,307	5,459	5,611	5,764	5,917
TOTAL OPERATING COSTS/BOX	5.43	5.37	5.31	5.25	5.20	5.15	5.10
CASH OVERHEAD COSTS/ACRE							
CASH OVERHEAD COSTS/ACRE	352	352	352	352	352	352	352
TOTAL CASH COSTS/ACRE	5,352	5,505	5,659	5,811	5,963	6,116	6,269
TOTAL CASH COSTS/BOX	5.82	5.73	5.66	5.59	5.52	5.46	5.40
NON-CASH OVERHEAD COSTS/ACRE							
NON-CASH OVERHEAD COSTS/ACRE	79	79	79	79	79	79	79
TOTAL COSTS/ACRE	5,431	5,584	5,738	5,890	6,042	6,195	6,348
TOTAL COSTS/BOX	5.90	5.82	5.74	5.66	5.59	5.53	5.47

*box = 25 lbs

NET RETURNS PER ACRE ABOVE OPERATING COSTS

Tomatoes	YIELD (BOX/ACRE)						
	920	960	1,000	1,040	1,080	1,120	1,160
\$/box							
4.50	-860	-833	-807	-779	-751	-724	-697
5.50	60	127	193	261	329	396	463
6.00	520	607	693	781	869	956	1,043
6.50	980	1,087	1,193	1,301	1,409	1,516	1,623
7.00	1,440	1,567	1,693	1,821	1,949	2,076	2,203
7.50	1,900	2,047	2,193	2,341	2,489	2,636	2,783
8.00	2,360	2,527	2,693	2,861	3,029	3,196	3,363

NET RETURNS PER ACRE ABOVE CASH COSTS

Tomatoes	YIELD (BOX/ACRE)						
	920	960	1,000	1,040	1,080	1,120	1,160
\$/box							
4.50	-1,212	-1,185	-1,159	-1,131	-1,103	-1,076	-1,049
5.50	-292	-225	-159	-91	-23	44	111
6.00	168	255	341	429	517	604	691
6.50	628	735	841	949	1,057	1,164	1,271
7.00	1,088	1,215	1,341	1,469	1,597	1,724	1,851
7.50	1,548	1,695	1,841	1,989	2,137	2,284	2,431
8.00	2,008	2,175	2,341	2,509	2,677	2,844	3,011

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

Table 4. CONTINUED
SAN JOAQUIN VALLEY – 2007

NET RETURNS PER ACRE ABOVE TOTAL COSTS

Tomatoes \$/box	YIELD (BOX/ACRE)						
	920	960	1,000	1,040	1,080	1,120	1,160
4.50	-1,291	-1,264	-1,238	-1,210	-1,182	-1,155	-1,128
5.50	-371	-304	-238	-170	-102	-35	32
6.00	89	176	262	350	438	525	612
6.50	549	656	762	870	978	1,085	1,192
7.00	1,009	1,136	1,262	1,390	1,518	1,645	1,772
7.50	1,469	1,616	1,762	1,910	2,058	2,205	2,352
8.00	1,929	2,096	2,262	2,430	2,598	2,765	2,932

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

Table 5. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS
SAN JOAQUIN VALLEY - 2007

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
						Insur- ance	Taxes	
07	130 HP 2WD Tractor	93,043	10	27,483	11,435	430	603	12,468
07	200 HP MFWD Tractor	154,000	10	45,489	18,927	712	997	20,636
07	92 HP 2WD Tractor	59,563	10	17,594	7,320	275	386	7,981
07	Bed Shaper - 3 Row	13,292	12	1,841	1,594	54	76	1,724
07	Cultivator-Rolling 3 Row	8,535	12	1,182	1,024	35	49	1,107
07	Disk - Offset 26'	25,071	12	3,472	3,007	102	143	3,252
07	Disk - Stubble 16'	13,176	12	1,825	1,581	54	75	1,709
07	Ditcher - V	8,631	12	1,195	1,035	35	49	1,120
07	Fertilizer Injector	5,091	10	900	669	21	30	720
07	Flail Shredder 15'	13,675	10	2,418	1,797	57	80	1,935
07	Incorporator - 15'	18,644	9	3,725	2,584	80	112	2,776
07	Lister - 3 Row 15'	5,500	12	762	660	22	31	713
07	Pickup 1/2 ton	28,000	5	12,549	4,703	145	203	5,051
07	Saddle Tank 300 gal #1	2,374	5	773	449	11	16	476
07	Saddle Tank 300 gal #2	2,374	5	773	449	11	16	476
07	Scraper - Drag 10'	2,581	18	172	256	10	14	280
07	Spray Boom 20'	1,424	10	252	187	6	8	201
07	Spray Boom 25'	1,781	10	315	234	7	10	252
07	Subsoiler - 8'	12,500	10	2,211	1,642	53	74	1,768
07	Transplanter 3 Row	16,200	10	2,865	2,128	68	95	2,292
07	Triplane - 16'	22,253	12	3,082	2,669	90	127	2,886
07	Truck Water (2 ton)	52,000	10	15,360	6,391	240	337	6,968
TOTAL		559,708		146,238	70,742	2,520	3,530	76,792
60% of New Cost *		335,825		87,743	42,445	1,512	2,118	46,075

*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 2400 sqft	75,000	30		6,196	268	375	1,500	8,339
Fuel Tanks 2-300 gal	3,200	20	320	300	13	18	64	395
Shop/Field Tools	15,000	20	1307	1,413	58	82	350	1,902
Siphon Tubes (300)	4,200	5		1,031	15	21	84	1,151
TOTAL INVESTMENT	97,400		1,627	8,941	354	495	1,998	11,787

ANNUAL BUSINESS OVERHEAD

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Environmental Fees	1,200	acre	10.00	12,000
Liability Insurance	1,200	acre	1.08	1,296
Office Expense	1,200	acre	75.00	90,000
Rent - Tomato Land	150	acre	250.00	37,500
Sanitation (Toilets)	150	acre	7.50	1,125

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

Table 6. HOURLY EQUIPMENT COSTS

SAN JOAQUIN VALLEY – 2007

Yr	Description	Actual	Cash Overhead			Operating		Total Oper.	Total Costs/Hr.
		Hours Used	Capital Recovery	Insur- ance	Taxes	Repairs	Fuel & Lube		
07	130 HP 2WD Tractor	1200	5.72	0.22	0.30	4.15	19.96	24.11	30.35
07	200 HP MFWD Tractor	1600	7.10	0.27	0.37	3.93	30.70	34.63	42.37
07	92 HP 2WD Tractor	1200	3.66	0.14	0.19	2.66	11.95	14.61	18.60
07	Bed Shaper - 3 Row	166	5.76	0.20	0.27	2.62	0.00	2.62	8.85
07	Cultivator-Rolling 3 Row	166	3.70	0.13	0.18	1.69	0.00	1.69	5.70
07	Disk - Offset 26'	166	10.87	0.37	0.52	3.91	0.00	3.91	15.67
07	Disk - Stubble 16'	166	5.70	0.19	0.27	2.06	0.00	2.06	8.22
07	Ditcher - V	164	3.79	0.13	0.18	2.30	0.00	2.30	6.40
07	Fertilizer Injector	121	3.32	0.11	0.15	1.94	0.00	1.94	5.52
07	Flail Shredder 15'	200	5.40	0.17	0.24	6.40	0.00	6.40	12.21
07	Incorporator - 15'	166	9.37	0.29	0.41	5.39	0.00	5.39	15.46
07	Lister - 3 Row 15'	166	2.38	0.08	0.11	1.09	0.00	1.09	3.66
07	Pickup 1/2 ton	283	9.97	0.31	0.43	1.81	8.05	9.86	20.57
07	Saddle Tank 300 gal #1	300	0.90	0.02	0.03	0.65	0.00	0.65	1.60
07	Saddle Tank 300 gal #2	300	0.90	0.02	0.03	0.65	0.00	0.65	1.60
07	Scraper - Drag 10'	166	0.93	0.04	0.05	0.37	0.00	0.37	1.39
07	Spray Boom 20'	150	0.75	0.02	0.03	0.38	0.00	0.38	1.18
07	Spray Boom 25'	150	0.94	0.03	0.04	0.47	0.00	0.47	1.48
07	Subsoiler - 8'	200	4.93	0.16	0.22	2.80	0.00	2.80	8.11
07	Transplanter 3 Row	150	8.51	0.27	0.38	4.27	0.00	4.27	13.43
07	Triplane - 16'	250	6.40	0.22	0.30	3.33	0.00	3.33	10.25
07	Truck Water (2 ton)	200	19.15	0.72	1.01	4.93	7.93	12.86	33.74

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION
Table 7. OPERATIONS WITH EQUIPMENT & MATERIAL INPUTS
 San Joaquin Valley - 2007

Operation	Operation Month	Equipment Tractor	Implement	Non-Mach		Broadcast Rate/acre	Unit
				Labor hrs/acre	Material		
Cultural:							
Nutrition: Soil Sampling	Nov	Contract (PCA)				Soil Analysis	0.05 each
Land Prep: Stubble Disk 2X	Nov	200HP MFWD	Stubble Disk				
Land Prep: Chisel/Rip 2X	Nov	200HP MFWD	Subsoiler				
Land Prep: Triplane 2X	Nov	200HP MFWD	Triplane				
Nutrition: Soil Amendment	Nov	130HP 2WD	Fertilizer Spreader			Gypsum	2.00 ton
Land Prep: Disk	Nov	200HP MFWD	Disk Offset 26 ft				
Land Prep: List Beds/Spray Herbicide	Nov	200HP MFWD	Lister 2-Saddle Tanks Spray Boom 20 ft			Triflurex	1.00 pt
Land Prep: Shape Beds/Incorporate Herbicide	Nov	200HP MFWD	Bed Shaper 3 Row				
Weed: Spray Beds	Mar	130HP 2WD	2-Saddle Tanks Spray Boom 25 ft			Roundup	3.00 pt
Weed: Cultivate (break surface)	Apr	92HP 2WD	Rolling Cultivator 3 Row				
Nutrition: Fertilize	Apr	130HP 2WD	Fertilizer Injector 2-Saddle Tanks			8-8-8 Zinc	1,000.00 lb 10.00 lb
Weed: Spray & Incorporate Herbicide	Apr	130HP 2WD	Incorporator 3 Row 2-Saddle Tanks			Triflurex Dual	1.00 pt 2.00 pt
Plant: Transplant Seedlings/Fertilize/Insect	Apr	92HP 2WD	Transplanter 3 Row 2-Saddle Tanks			Seed Transplants 10-34-00 Zinc Humic Acid Admire	6.55 thou 6.55 thou 30.00 lb 0.50 gal 1.00 gal 10.00 floz
Irrigation: Make Ditches	Apr June June	130HP 2WD 130HP 2WD 130HP 2WD	Ditcher - V Ditcher - V Ditcher - V				
Irrigation: Close Ditch	May June July	130HP 2WD 130HP 2WD 130HP 2WD	Scraper - Drag Scraper - Drag Scraper - Drag				
Irrigate	Apr May June July			0.50 1.00 1.50 0.50		Water Water Water Water	5.14 acin 10.28 acin 15.42 acin 5.16 acin
Disease: Speck	Apr May	130HP 2WD 130HP 2WD	2-Saddle Tanks Spray Boom 25 ft 2-Saddle Tanks Spray Boom 25 ft			Kocide Dithane Kocide Dithane	2.00 lb 2.00 lb 2.00 lb 2.00 lb
Weed: Cultivate	May June	92HP 2WD 92HP 2WD	Rolling Cultivator 3 Row Rolling Cultivator 3 Row				
Weed: Hand Hoe	May	Custom/Contract					
Insect: Stinkbug & Mites	May	130HP 2WD	2-Saddle Tanks Spray Boom 25 ft			Asana Kelthane	8.00 floz 1.00 pt
Insect: Stinkbug, Mites, Worms	June	130HP 2WD	2-Saddle Tanks Spray Boom 25 ft			Asana Agri-Mek Avaunt	8.00 floz 12.00 floz 3.50 oz
Nutrition: Tissue Samples	June	Contract (PCA)				Analysis	0.05 each
Weed: Layby	June	92HP 2WD	Rolling Cultivator 2-Saddle Tanks Spray Boom 20 ft			Dual	1.00 pt
Nutrition: Fertilize (sidedress)	May	130HP 2WD	Fertilizer Injector 2-Saddle Tanks			UN 32	70.00 lb N
Nutrition: Fertilize (water run)	June					CAN 17	10.00 lb N

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

Table 7. CONTINUED
San Joaquin Valley - 2007

Operation	Operation Month	Equipment Tractor	Implement	Non-Mach Labor hrs/acre	Material	Broadcast Rate/acre	Unit
Harvest: Pick	July	Custom/Contract				18.00	ton
Harvest: Haul to Shed	July	Custom/Contract				18.00	ton
Pack	July	Custom/Contract				1,040.00	box
Water Roads	All	Water Truck					
Field Cleanup: Mow plants	Aug	130HP 2WD	Flail Shredder 15 ft				
Field Cleanup: Disk Crop Residue	Aug	200HP MFWD	Stubble Disk				