UNIVERSITY OF CALIFORNIA – COOPERATIVE EXTENSION

2014

SAMPLE COSTS TO PRODUCE PROCESSING TOMATOES

SUB-SURFACE, DRIP IRRIGATED (SDI) IN THE SACRAMENTO VALLEY & NORTHERN DELTA

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UC COOPERATIVE EXTENSION

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In the Sacramento Valley & northern Delta – 2014

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INTRODUCTION

The sample costs to produce transplanted processing tomatoes under sub-surface, drip irrigation (SDI), in the Sacramento Valley and northern Delta 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 production practices considered typical for the crop and area, but will not apply to every situation. Sample costs for labor, materials, equipment, and custom services are based on current figures. Blank columns, "Your Costs", in Tables 1 and 2 are provided to enter actual costs of an individual farm operation.

The hypothetical farm operations, production practices, overhead, and calculations are described under the assumptions. For additional information or an explanation of the calculations used in the study, contact the Department of Agricultural and Resource Economics, University of California, Davis, (530) 752-4651 or destewart@ucdavis.edu. An additional cost of production study for processing tomatoes grown in this region under furrow irrigation is also available: ("Sample Costs to Produce Processing Tomatoes, Furrow Irrigated in the Sacramento Valley & Northern Delta - 2014"). The major differences between the two companion studies are in cultivation, fertilizer, ground prep, irrigation and yield.

Sample Costs of Production Studies for many commodities are available at http://coststudies.ucdavis.edu/.

ASSUMPTIONS

The following assumptions refer to tables 1 to 7 and pertain to sample costs and returns to produce transplanted processing tomatoes under sub-surface, drip irrigation (SDI), in the Sacramento Valley and northern Delta. Input prices and interest rates are based on 2014 values. Practices described are not recommendations by the University of California, but represent production practices considered typical of a well-managed farm for this crop and area. Some of the costs and practices listed may not be applicable to all situations nor used during every production year and/or additional ones not indicated may be needed. Processing tomato cultural practices and material input costs will vary by grower and region, and can be significant. The practices and inputs used in the cost study serve as a guide only. The costs are shown on an annual, per acre basis. Approximately two thirds of the total local tomato acreage in the region is estimated to be grown with sub-surface, drip irrigation. 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 hypothetical field and row-crop farm consists of 3,500 non-contiguous acres of rented land at 12% of gross tomato revenue for this budget. Tomatoes are transplanted on 1,000 acres (700 acres are sub-surface drip irrigated and 300 acres are furrow irrigated). Twenty five hundred acres are planted to other rotational crops including alfalfa hay, field corn, safflower, sunflower, dry beans and/or wheat. The grower also owns various investments such as a shop and an equipment yard. In this report, practices completed on less than 100% of the acres are denoted as a percentage of the total tomato crop acreage. The costs associated with GPS tractor mounted guidance and precision agriculture systems are included in this study. Usage of these systems can reflect a significant cost savings.

CULTURAL PRACTICES AND MATERIAL INPUTS

Land Preparation. In the fall, bed tillage equipment is used to maintain semi-permanent beds on the 80% of the acreage with the drip tape in place. Furrows are chiseled to a 15-inch depth and rolled. Subsequently, a 3-row Performer shallowly chisels, tills and reshapes the beds while avoiding disturbance of the drip tape.

One fifth of the drip tape (140 acres) is removed each year after a five year life expectancy and is included in the post-harvest costs. On these acres, in the year preceding tomato transplanting, primary tillage includes operations to disc & roll, sub-soil, landplane, and list beds which is done from August through early December. To maintain surface grade on some of the acres where the drip tape is replaced, one fifth of 20% (28 acres) is laser leveled each year. Fields are stubble disced and rolled (with a rice roller). Fields are sub-soiled in two passes to a 30-inch depth while also rolled in the same pass. A medium-duty disc coupled with a ring roller follows. Ground is smoothed in two passes with a triplane. Beds on five-foot centers are made with a six-bed lister. Drip tape is installed at 10” depth (1 line/bed, 5 beds/pass), with beds re-shaped in the same operation. Drip tape is reconnected by hand to underground PVC water supply lines.

Transplanting. Planting is spread over a 10-week period to meet contracted weekly delivery schedules at harvest. Seedlings are transplanted in double-lines per bed. All of the 700 acres are custom planted with greenhouse-grown transplants. The grower supplies the seed to the greenhouse operation to grow the transplants. Additional seed (15% above the quantity for the desired number of transplants) is needed to compensate for imperfect germination and for non-useable, damaged seedlings.

Fertilization. In the fall, ahead of listing beds, soil amendment gypsum at 3 tons per acre is custom broadcast on 20% of the acres. Prior to transplanting, liquid starter fertilizer, 8-24-6 plus 2% zinc, is applied

at 8 lbs. of N per acre with tractor and implement. Nitrogen fertilizer, UN-32 at 200 lbs. N per acre is injected at multiple intervals through the drip system over the growing season. Some growers are applying additional micronutrients, biologicals and manures or planting cover crops on part of their acreage; but as these are not common practices, the associated costs are not included in this study.

Irrigation. In this study, water is a combination of 1/2 well water/pumped at $90 per acre-foot and 1/2 canal/district delivered surface water at $40 per acre-foot. For this study an average cost of $65 per acre foot (or $5.42 per acre-inch) is charged. The irrigation costs itemized and shown in Tables 1 and 3 for sprinklers include labor, pumping and water. The drip irrigation costs for water & pumping are itemized separately from irrigation labor. Three, ½-ton pickup trucks used for irrigation are itemized separately also.

Total applied water was calculated at 30 acre-inches (2.5 acre-feet). Sprinkler irrigation was used on 50% of the acres at 2 acre-inches as a single application, either as a preplant in the spring or to establish the stand after planting. The remaining 28 acre-inches are applied through the drip system to match crop evapotranspiration and to account for 85% irrigation system efficiency. The drip system requires chemical flushing to retard calcium buildup and emitter clogging. For this study the operation is performed after harvest with Infuric acid applied through the drip system with 0.5 acre-inch of water. The extra 0.5 acre-inch adds to the total of 30.5 inches of water shown in Table 2.

Drip tape maintenance costs are lower in the first year and increase over the 5-year life expectancy of the drip tape. The costs are for repairs, additional labor and time for flushing the system and adding chemicals to reduce drip emitter clogging. For this study approximately $57 per acre is used to capture these costs.

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*. **Pesticides mentioned in this study are not recommendations, but those commonly used in the region**. For information on pesticide use permits, contact the local county Agricultural Commissioner's office. For information on other pesticides available, pest identification, monitoring, and management, visit the UC IPM website at www.ipm.ucdavis.edu. **Pest control costs can vary considerably each year depending upon local conditions and pest populations in any given year**. Adjuvants are recommended for many pesticides for effective control and are an added cost. Adjuvants are not included as a cost in this study.

Pest Control Adviser/Certified Crop Advisor (PCA/CCA). Written recommendations are required for many pesticides and are available from licensed pest control or certified crop advisers. In addition the PCA/CCA or an independent consultant will monitor the field for agronomic problems including irrigation and nutrition. Growers may hire a private PCA/CCA or receive the service as part of a service agreement with an agricultural chemical and fertilizer company.

Weeds. Beginning in January, glyphosate (Roundup UltraMax) plus oxyfluorfen (Goal 2XL) is sprayed on the fallow beds to control emerged weeds and repeated later with Roundup only. The applications are made with an ATV-pulled sprayer.

Before planting, the beds are cultivated to control weeds and to prepare the seedbed. As a preplant in the spring, trifluralin (Triflurex HFP) is tank-mixed with metolachlor (Dual II Magnum) and incorporated with a power mulcher on all acres. Post-transplant, rimsulfuron (Matrix DF) is sprayed on 100% of all the acreage. Again, post-transplant Triflurex HFP is incorporated into the soil as a layby application.

A combination of hand weeding and mechanical cultivation is also used for weed control. The crop is mechanically cultivated with a sled-mounted cultivator once during the season. A contract labor crew hand-removes weeds during the season.

Insects, Diseases & Vertebrate pests. The primary insect pests of seedlings included in this study are flea beetle, darkling ground beetle, and cutworm. Foliage and fruit feeders included are tomato fruitworm, various armyworm species, russet mite, stinkbug, and potato aphid. Diseases that are treated are primarily bacterial speck, occasionally late blight, and blackmold fruit rot. Vertebrate pests include squirrels, rabbits and gophers. For gopher control, zinc phosphide is injected into gopher tunnels with a hand-held probe. Traps are also setup inside the gopher tunnels.

In this study, Kocide for bacterial speck is applied to 30% of the acres. Warrior is applied to 20% acreage for aphid control. Sulfur dust for russet mite and powdery mildew control is custom applied to 40% of the acres. Confirm for worm control is applied to 100% of the acres. Bravo-Weatherstik is applied in June to 5% of the acres for late blight control and in September as a fruit protectant fungicide on 15% of the acres. The application rates shown in Table 2 are adjusted to reflect the percent of acreage treated.

Fruit Ripener. Ethrel, a fruit ripening agent, is applied with a ground sprayer three weeks before harvest to 5% of the acreage. The rate in table 2 is for 5% of an acre.

Harvest. The fruit is mechanically harvested by grower-owned and operated harvesters on 50% of the acreage while the remaining 50% is custom harvested by processor-owned-and-operated harvesters. The custom harvesting includes opening harvest lanes, harvesting, in-field hauling, and generator-light machines for night harvesting. The grower uses a newer machine for 50% of the 700 acres. Typically growers of this scale also own an older, back-up harvester. Harvest support equipment includes tractors, trailer dollies, generator-light machines, and fuel trailers. A crew of 4 manual sorters, a harvester driver, and two bulk-trailer tractor drivers are used per harvester. A seasonal average of 2 loads per hour at 25 tons per load are harvested with two (one day and one night) shifts of 10 hours each. Harvest efficiency includes maintenance & cleaning, scheduled daily breaks, and transportation between fields. The processor pays the transportation cost of the tomatoes from the field to the processing plant.

Costs for harvest operations are shown in Tables 1, 3 and 4; the equipment used is listed in Tables 5-6. Growers may choose to own harvesting equipment, purchase either new or used or hire a custom harvester. Many factors are important in deciding which harvesting option a grower uses.

Yields. An average of annual county tomato yields combined across the Sacramento Valley including neighboring San Joaquin County over the past ten years ranged from 34.30 to 42.65 tons per acre. The reporting counties were Colusa, Sacramento, Solano, Sutter, Yolo, San Joaquin and sometimes Glenn. Butte and Tehama are the only Sacramento Valley counties that do not report their processing tomato production average. In this study, a yield of 44 tons per acre is used to reflect higher yields under drip irrigation.

Returns. Customarily, growers produce tomatoes under annual contracts with various tomato processors. Average prices in the Sacramento Valley range from $48.06 to $80.74 per ton over the last 10 years. A price of $80.00 per ton is used in this study.

Assessments. Under a state marketing order a mandatory assessment fee is collected and administered by the Processing Tomato Advisory Board (PTAB) to inspect and grade fruit. Fees vary between inspection stations. In Yolo County, inspection fees in 2013 ranged from $6.36 to $8.90 per load with an average of

$6.75. Growers and processors share equally in the fee; growers pay $3.38 per load in this study. A truckload is assumed to be 25 tons so the cost per ton is $0.14. Tomato growers are also assessed a fee for the Curly Top Virus Control Program (CTVCP) administered by the California Department of Food and Agriculture (CDFA). Growers in Yolo County (District 111) are charged $0.019 per ton. Additionally, several voluntary organizations assess member growers. California Tomato Growers Association (CTGA) represents growers' interest in negotiating contract prices with processors and for grower advocacy. CTGA membership charges are $0.17 per ton. The California Tomato Research Institute (CTRI) funds projects for crop improvement. CTRI membership charges are $0.07 per ton.

Labor. Basic wages are $12.50 and $10.00 per hour for machine operators and non-machine workers (irrigators and manual laborers), respectively. Adding 36% for the employer's share of federal and state payroll taxes, insurance and other benefits raises the total labor costs to $17.00 per hour for machine operators and $13.60 per hour for non-machine laborers. The labor for operations involving machinery is 20% higher than the field operation time to account for equipment set up, road travel, maintenance, and repair. The current minimum wage is $9.00 per hour.

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, supervisors' salaries, field sanitation, crop insurance, and investment repairs. Employee benefits, insurance, and payroll taxes are included in labor costs and not in overhead. Cash overhead costs are shown in Tables 1, 2, 3, 4 and 5.

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.

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 5.75% per year. A nominal interest rate is the typical market cost of borrowed funds.

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 0.740% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs $5,250 for the entire farm or $1.50 per acre.

Office Expense. Office and business expenses are estimated to be $175,000 for the entire farm or $50.00 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, road maintenance, office and shop utilities, and miscellaneous administrative expenses.

Share Rent. Rent arrangements will vary. For this study 100% of the land is rented at 12.0% of gross revenue for the tomatoes. Land rent includes use of developed wells and access to surface delivered water.

Field Supervisors Salary. Supervisors' salaries include insurance, payroll taxes and benefits. Two thirds of one supervisor's time is allocated to tomatoes at $85 per acre.

Assistant Managers Salary. Assistant managers' salaries include insurance, payroll taxes and benefits at $21 per acre is allocated to tomatoes.

Field Sanitation. Sanitation services provide portable toilet and washing facilities for the ranch during the crop season. The cost includes delivery and weekly service. Costs will vary depending upon the crops and number of portable units required.

Crop Insurance. The insurance can protect the grower from crop losses due to adverse weather conditions, fire, wildlife, earthquake, volcanic eruption, catastrophic diseases and/or insects and failure of the irrigation system due to a natural disaster. The grower can choose the protection level at 50% to 75% of production history or county yields. In this study, no level is specified.

Miscellaneous Costs. Included expenses are employee safety training as well as pesticide use and regulatory continuing education training, employee bonuses, additional materials and applications for unique fields or special conditions.

Investment Repairs. Annual repairs on investment or capital recovery items that require maintenance are calculated as 2% of the purchase price.

NON-CASH OVERHEAD

Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments. Although farm equipment used for processing tomatoes may be purchased new or used, this study shows the current purchase price for new equipment. The new purchase price is adjusted to 60% to reflect a mix of new and used equipment. Annual ownership costs (equipment and investments) are shown in Tables 1, 2, and 5. They represent the capital recovery cost for investments on an annual per acre basis.

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 prices and salvage values (unrecovered capital). It is equivalent to the annual payment on a loan for the investment with the down payment equal to the discounted salvage value. This is a more complex method of calculating ownership costs than straight-line depreciation and opportunity costs, but more accurately represents the annual costs of ownership because it takes the time value of money into account (Boehlje and Eidman). The formula for the calculation of the annual capital recovery costs is;

[{Purchase Price - Salvage Value} x Capital Recovery Factor] + [Salvage Value x Interest Rate]

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery 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 for this study. The salvage value for land is equal to the purchase price because land does not depreciate. The purchase price and salvage value for certain 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 and the life of the equipment.

Interest Rate. The interest rate of 4.75% used to calculate capital recovery cost is the effective long-term interest rate in January 2014. The interest rate 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.

Equipment Costs. Equipment costs are composed of three parts: non-cash overhead, cash overhead, and operating costs. The non-cash overhead was discussed above. The cash overhead consists of property taxes and insurance on the equipment at the rates given above. The operating costs consist of repairs, fuel, and lubrication. The fuel, lube, and repair cost per acre for each operation in Table 1 is determined by multiplying the total hourly operating cost in Table 6 for each piece of equipment used for the selected operation by the hours per acre. Tractor time is 10% higher than implement time for a given operation to account for setup and travel time.

Fuel, Lube & Repairs. Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by the ASAE. Fuel and lubrication costs are also determined by ASAE equations based on maximum Power-Take-Off horsepower, and fuel type. Prices for on-farm delivery of diesel and unleaded gasoline are $4.12 and $3.93 per gallon, respectively.

Irrigation System. The land owner is responsible for the main pumps and water delivery to the grower's irrigation system. Irrigation equipment owned by the grower consists of booster pumps, pipe main lines, hand- moved sprinklers, siphon tubes and various hand tools. Drip system equipment owned by the grower consists of filters, booster & injector pumps and drip tape installing & extracting implements. Grower costs include connections to pump, drip tape installation, sub-main water supply lines and installation, pressure regulators and air vents. Multi-year rental agreements are likely to spread expenses over years.

Risk. Risks associated with processing tomato production are not assigned a production cost. All acres are contracted prior to harvest and all tonnage-time delivery contracts are assumed to have been met. No excess acres are grown to fulfill contracts. While this study makes an effort to model a production system based on typical, real world practices, it cannot fully represent financial, agronomic and market risks which affect the profitability and economic viability of processing tomato production. Any returns above total costs are considered returns on risk and investment to management (or owners).

Table Values. Due to rounding, the totals may be slightly different from the sum of the components.

REFERENCES

American Society of Agricultural Engineers. 2011. American Society of Agricultural Engineers Standards Yearbook. Russell H. Hahn and Evelyn E. Rosentreter (ed.) St. Joseph, Missouri. 41st edition.

California Department of Insurance, Rate Regulation Branch
http://www.insurance.ca.gov/0500-about-us/

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

California State Automobile Association. 2014. Gas Price Averages first 4 months 2014. AAA Press Room, San Francisco, CA.
http://www.csaa.com/portal/site/CSAA/menuitem.5313747aa611bd4e320cfad592278a0c/?vgnextoid=8d642ce6cda97010VgnVCM1000002872a8c0RCRD.

CDFA-California County Agricultural Commissioners, California Annual Agricultural Crop Reports.2004 – 2013. California Department of Food and Agricultural, Sacramento, CA.
http://www.nass.usda.gov/ca/bul/agcom/indexcac.htm.

University of California Integrated Pest Management Guidelines, Tomato. University of California Agriculture and Natural Resources.
http://www.ipm.ucdavis.edu/PMG/selectnewpest.tomatoes.html

Miyao, Gene, Karen Klonsky, and Pete Livingston. 2007. "Sample Costs To Produce Processing Tomatoes, Transplanted, In the Sacramento Valley - 2007". University of California, Cooperative Extension. Department of Agricultural and Resource Economics. Davis, CA. http://coststudies.ucdavis.edu/.

Statewide Integrated Pest Management Project. 1998. Integrated Pest Management for Tomatoes. Fourth Edition. University of California. Division of Agriculture and Natural Resources. Oakland, CA. Publication 3274. http://www.ipm.ucdavis.edu/PMG/selectnewpest.tomatoes.html.

USDA Economics, Statistics and Market Information System (ESMIS) Agriculture and Rural Economics Division, ERS. USDA. Washington, DC. http://usda.mannlib.cornell.edu/MannUsda/homepage.do

John Deere Equipment Configurator.
https://configurator.deere.com/servlet/com.deere.u90947.eproducts.view.servlets.EProductsInitializationServlet?sbu=AG&userAction=&lang=en&country=us.

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TABLE 1. COSTS PER ACRE TO PRODUCE PROCESS TOMATOES (SDI)

Operation	Equipment Operation (Hrs/A)	Cash and Labor Costs per Acre: Labor Cost	Fuel	Lube & Repairs	Material Cost	Custom/ Rent	Total Cost	Your Cost
Preplant:								
Laser level 4 % Ac	0.00	0	0	0	0	7	7	
Chisel Furrows 80% Ac	0.11	2	6	2	0	0	10	
Condition Beds 80% Ac	0.10	2	5	2	0	0	10	
Stubble Disc & Roll 20% Ac	0.04	1	3	1	0	0	5	
Sub-Soil & Roll 20% Ac	0.06	1	6	2	0	0	9	
Finish Disc & Roll 20% Ac	0.02	0	1	0	0	0	2	
Land Plane 2X 20% Ac	0.05	1	3	1	0	0	5	
Gypsum 20% Ac	0.00	0	0	0	0	42	42	
List Beds 6-Row 20% Ac	0.02	0	2	1	0	0	3	
5-Row Shape/Insert Drip Tape 20% Ac	0.11	16	10	3	0	0	28	
Pest Control-Weeds Roundup/Goal 2XL	0.08	2	0	0	22	0	24	
Pest Control-Weeds Roundup	0.08	2	0	0	13	0	15	
TOTAL PREPLANT COSTS	0.68	28	37	13	34	49	160	
Cultural:								
Open Beds-3 Row Alloway	0.14	3	5	2	0	0	9	
Mulch Beds-Apply Herbicides	0.20	4	8	3	34	0	49	
Fertilize-Starter 8-24-6, 2% Zn	0.23	5	9	4	27	0	45	
Transplant Tomatoes	0.00	0	0	0	425	211	636	
Pest Control-Weeds Post Plant herbicide	0.08	2	3	1	12	0	17	
Irrigate-Sprinklers 50% Ac	1.00	20	9	1	11	0	42	
Irrigate-Drip	0.00	0	0	0	152	0	152	
Pest Control-Weeds Close Cultivate	0.22	4	7	3	0	0	14	
Fertigation-UN 32	0.00	0	0	0	168	0	168	
Pest Control-Weeds Hand Hoe	0.00	0	0	0	0	80	80	
Pest Control-Weeds Herbicide Layby	0.23	5	9	4	4	0	22	
Pest Control-Bacterial Speck 30% Ac	0.02	0	1	0	3	0	4	
Pest Control-Aphids 20% Ac	0.02	0	1	0	1	0	2	
Pest Control-Late Blight 5% Ac	0.00	0	0	0	1	0	1	
Trim Vines	0.18	4	6	2	0	0	12	
Pest Control-Mites 40% Ac	0.00	0	0	0	4	7	11	
Irrigation Labor	0.00	109	0	0	0	0	109	
Pest Control-Fruit Rot 15% Ac	0.01	0	0	0	2	0	3	
Pest Control-Worms	0.08	2	3	1	22	0	28	
Fruit Ripener-Ethrel 5% Ac	0.00	0	0	0	2	0	2	
Service Truck	0.50	10	2	3	0	0	15	
Water Truck	0.33	7	3	4	0	0	14	
Back Hoe	0.20	4	5	1	0	0	9	
Road Grader	0.17	3	5	1	0	0	9	
Truck-Lowbed Trailer	0.17	3	3	2	0	0	8	
1/2 Ton Pickup (3)	1.60	33	6	4	0	0	43	
3/4 Ton Pickup (2)	0.50	10	3	1	0	0	15	
Pest Control-Vertebrate	0.20	7	1	0	6	0	14	
TOTAL CULTURAL COSTS	6.07	236	89	39	872	299	1,534	
Harvest:								
Harvest Custom 50% Ac	0.00	0	0	0	0	253	253	
Open Harvest Lanes 4% Ac	0.07	1	2	1	0	0	5	
Harvest Self 50% Ac	0.44	29	40	77	0	0	146	
In Field Hauling (2)	0.87	18	35	12	0	0	65	
Share Rent 12.0%	0.00	0	0	0	422	0	422	
TOTAL HARVEST COSTS	1.38	48	78	91	422	253	891	
Post-Harvest:								
Irrigation-Drip Chemigation	0.00	0	0	0	3	0	3	
Drip Tape System Maintenance	0.20	52	1	0	0	0	54	

TABLE 1. CONTINUED

	Equipment Operation (Hrs/A)	Cash and Labor Costs per Acre						
		Labor Cost	Fuel	Lube & Repairs	Material Cost	Custom/ Rent	Total Cost	Your Cost
Drip Tape Extraction 20% Ac	0.10	10	9	3	0	0	22	
TOTAL POST-HARVEST COSTS	0.30	63	10	3	3	0	79	
Assessment:								
PTAB, CTGA, CTRI, CDFA-CTVP	0.00	0	0	0	17	0	17	
TOTAL ASSESSMENT COSTS	0.00	0	0	0	17	0	17	
Interest on Operating Capital at 5.75%							51	
TOTAL OPERATING COSTS/ACRE	8	374	213	146	1,349	600	2,733	
CASH OVERHEAD:								
Liability Insurance							2	
Office Expense							50	
Field Sanitation							1	
Field Supervisor							85	
Miscellaneous Costs (Training etc.)							20	
Assistant Manager							21	
Property Taxes							8	
Property Insurance							6	
Investment Repairs							5	
TOTAL CASH OVERHEAD COSTS/ACRE							198	
TOTAL CASH COSTS/ACRE							2,930	
NON-CASH OVERHEAD:		Per Producing Acre		Annual Cost Capital Recovery				
GPS Sending Unit		2		0			0	
GPS Receivers (2)		1		0			0	
Shop Building		36		2			2	
Storage Building		14		1			1	
Fuel Tanks & Pumps		7		1			1	
Shop Tools		6		0			0	
Generators & Light (2)		5		1			1	
Closed Mix System		1		0			0	
Sprinkler Pipe		32		4			4	
Pipe Main Line 10" 1/2 Mile		15		2			2	
Drip Irrigation System		900		62			62	
Drip Tape		300		69			69	
Implement Carrier		5		0			0	
Truck-Bobtail-5th Wheel		13		1			1	
Equipment		657		79			79	
TOTAL NON-CASH OVERHEAD COSTS		1,994		223			223	
TOTAL COSTS/ACRE							3,153	

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TABLE 2. COSTS AND RETURNS PER ACRE TO PRODUCE PROCESS TOMATOES (SDI)

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Tomatoes (SDI)	44	Ton	80.00	3,520	
TOTAL GROSS RETURNS	44	Ton		3,520	
OPERATING COSTS					
Fertilizer:				**195**	
8-24-6, 2% Zn	8.00	Lb/N	3.34	27	
UN-32	200.00	Lb N	0.84	168	
Custom:				**520**	
Laser Level	0.04	Acre	165.00	7	
Gypsum-Hauled Spread	0.60	Ton	70.00	42	
Transplanting	8.80	Thou	24.00	211	
Air App Dusting	2.40	Lb	1.15	3	
Air App Spray 10g	0.40	acre	11.80	5	
Harvest	22.00	ton	11.50	253	
Insecticide:				**27**	
Warrior II	0.38	FlOz	3.05	1	
Sulfur DF	2.40	Lb	1.57	4	
Confirm	10.00	FlOz	2.23	22	
Fungicide:				**6**	
Kocide DF	0.75	Lb	3.62	3	
Bravo Weatherstik	0.40	Pint	7.85	3	
Herbicide:				**84**	
Roundup UltraMax	3.00	Pint	8.59	26	
Goal 2XL	8.00	FlOz	1.08	9	
Triflurex HFP	2.00	Pint	4.07	8	
Dual II Magnum	1.33	Pint	22.50	30	
Matrix DF	0.50	Oz	23.83	12	
Vertebrate Pest Control:				**6**	
Zinc Phosphide	0.50	Lb	2.50	1	
Gopher Trap	0.50	Each	8.50	4	
Growth Regulator:				**2**	
Ethrel	0.20	Pint	8.92	2	
Infuric Acid	0.12	Gal	1.00	0	
Contract:				**80**	
Thin & Hoe	0.80	Acre	100.00	80	
Seed:				**180**	
Tomato Seed Thou	10.02	Thou	18.00	180	
Transplant:				**244**	
Transplants-Growing	8.72	Thou	28.00	244	
Irrigation:				**165**	
Water Average Costs	30.50	AcIn	5.42	165	
Assessment:				**17**	
PTAB	44.00	Ton	0.14	6	
CTGA	44.00	Ton	0.17	7	
CTRI	44.00	Ton	0.07	3	
CDFA-CTVP	44.00	Ton	0.02	1	
Land Rent:				**422**	
Share Rent 12.0%	44.00	Ton	9.60	422	
Labor				**374**	
Equipment Operator Labor	10.12	Hrs	17.00	172	
Non-Machine Labor	6.84	Hrs	13.60	93	
Irrigation Labor	8.00	Hrs	13.60	109	
Machinery				**359**	
Fuel-Gas	2.92	Gal	3.93	11	
Fuel-Diesel	48.88	Gal	4.12	201	
Lube				32	
Machinery Repair				114	
Interest on Operating Capital @ 5.75%				51	
TOTAL OPERATING COSTS/ACRE				2,733	
TOTAL OPERATING COSTS/TON				62	
NET RETURNS ABOVE OPERATING COSTS				787	

TABLE 2. CONTINUED

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
CASH OVERHEAD COSTS					
Liability Insurance				2	
Office Expense				50	
Field Sanitation				1	
Field Supervisor				85	
Miscellaneous Costs (Training etc.)				20	
Assistant Manager				21	
Property Taxes				8	
Property Insurance				6	
Investment Repairs				5	
TOTAL CASH OVERHEAD COSTS/ACRE				198	
TOTAL CASH OVERHEAD COSTS/TON				4	
TOTAL CASH COSTS/ACRE				2,930	
TOTAL CASH COSTS/TON				67	
NET RETURNS ABOVE CASH COSTS				590	
NON-CASH OVERHEAD COSTS (Capital Recovery)					
GPS Sending Unit				0	
GPS Receivers (2)				0	
Shop Building				2	
Storage Building				1	
Fuel Tanks & Pumps				1	
Shop Tools				0	
Generators & Light (2)				1	
Closed Mix System				0	
Sprinkler Pipe				4	
Pipe Main Line 10" 1/2 Mile				2	
Drip Irrigation System				62	
Drip Tape				69	
Implement Carrier				0	
Truck-Bobtail-5th Wheel				1	
Equipment				79	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				223	
TOTAL NON-CASH OVERHEAD COSTS/TON				5	
TOTAL COST/ACRE				3,153	
TOTAL COST/TON				72	
NET RETURNS ABOVE TOTAL COST				367	

UC COOPERATIVE EXTENSION
TABLE 3. MONTHLY COSTS PER ACRE TO PRODUCE PROCESS TOMATOES (SDI)

	OCT 13	NOV 13	DEC 13	JAN 14	FEB 14	MAR 14	APR 14	MAY 14	JUN 14	JUL 14	AUG 14	SEP 14	Total
Preplant:													
Laser level 4 % Ac	7												7
Chisel Furrows 80% Ac	10												10
Condition Beds 80% Ac	10												10
Stubble Disc & Roll 20% Ac	5												5
Sub-Soil & Roll 20% Ac	9												9
Finish Disc & Roll 20% Ac	2												2
Land Plane 2X 20% Ac	5												5
Gypsum 20% Ac	42												42
List Beds 6-Row 20% Ac		3											3
5-Row Shape/Insert Drip Tape 20% Ac		28											28
Pest Control-Weeds Roundup/Goal 2XL				24									24
Pest Control-Weeds Roundup						15							15
TOTAL PREPLANT COSTS	90	31		24		15							160
Cultural:													
Open Beds-3 Row Alloway						9							9
Mulch Beds-Apply Herbicides						25		25					49
Fertilize-Starter 8-24-6, 2% Zn						22		22					45
Transplant Tomatoes							318	318					636
Pest Control-Weeds Post Plant Herbicide							9	9					17
Irrigate-Sprinklers 50% Ac							21	21					42
Irrigate-Drip							22	27	33	43	27		152
Pest Control-Weeds Close Cultivate							7	7					14
Fertigation-UN 32							42	42	42	42			168
Pest Control-Weeds Hand Hoe								40	40				80
Pest Control-Weeds Herbicide Layby								11	11				22
Pest Control-Bacterial Speck 30% Ac								2	2				4
Pest Control-Aphids 20% Ac									2				2
Pest Control-Late Blight 5% Ac									1				1
Trim Vines										6	6		12
Pest Control-Mites 40% Ac										6	6		11
Irrigation Labor											109		109
Pest Control-Fruit Rot 15% Ac												3	3
Pest Control-Worms												28	28
Fruit Ripener-Ethrel 5% Ac												2	2
Service Truck	1	1	1	1	1	1	1	1	1	1	1	1	15
Water Truck	1	1	1	1	1	1	1	1	1	1	1	1	14
Back Hoe	1	1	1	1	1	1	1	1	1	1	1	1	9
Road Grader	1	1	1	1	1	1	1	1	1	1	1	1	9
Truck-Lowbed Trailer	1	1	1	1	1	1	1	1	1	1	1	1	8
1/2 Ton Pickup (3)	4	4	4	4	4	4	4	4	4	4	4	4	43
3/4 Ton Pickup (2)	1	1	1	1	1	1	1	1	1	1	1	1	15
Pest Control-Vertebrate	1	1	1	1	1	1	1	1	1	1	1	1	14
TOTAL CULTURAL COSTS	11	11	11	11	11	67	429	535	142	108	158	43	1,534

TABLE 3. CONTINUED

	OCT 13	NOV 13	DEC 13	JAN 14	FEB 14	MAR 14	APR 14	MAY 14	JUN 14	JUL 14	AUG 14	SEP 14	Total
Harvest:													
Harvest Custom 50% Ac											253		253
Open Harvest Lanes 4% Ac												5	5
Harvest Self 50% Ac												146	146
In Field Hauling (2)												65	65
Share Rent 12.0%												422	422
TOTAL HARVEST COSTS	0	0	0	0	0	0	0	0	0	0	253	638	891
Post-Harvest:													
Irrigation-Drip Chemigation												3	3
Drip Tape System Maintenance												54	54
Drip Tape Extraction 20% Ac												22	22
TOTAL POST-HARVEST COSTS	0	0	0	0	0	0	0	0	0	0	0	79	79
Assessment:													
PTAB, CTGA, CTRI, CDFA-CTVP	1	1	1	1	1	1	1	1	1	1	1	1	17
TOTAL ASSESSMENT COSTS	1	1	1	1	1	1	1	1	1	1	1	1	17
Interest on Operating Capital @ 5.75%	0	1	1	1	1	1	3	6	7	7	9	13	51
TOTAL OPERATING COSTS/ACRE	102	44	13	37	13	85	434	542	150	116	422	775	2,733
CASH OVERHEAD													
Liability Insurance					2								2
Office Expense	4	4	4	4	4	4	4	4	4	4	4	4	50
Field Sanitation												1	1
Field Supervisor	7	7	7	7	7	7	7	7	7	7	7	7	85
Miscellaneous Costs (Training etc.)												20	20
Assistant Manager												21	21
Property Taxes				4						4			8
Property Insurance				3						3			6
Investment Repairs	0	0	0	0	0	0	0	0	0	0	0	0	5
TOTAL CASH OVERHEAD COSTS	12	12	12	19	13	12	12	12	12	19	12	53	198
TOTAL CASH COSTS/ACRE	114	56	24	55	26	97	445	554	161	135	434	828	2,930

TABLE 4. RANGING ANALYSIS - PROCESS TOMATOES (SDI)

COSTS PER ACRE AND PER TON AT VARYING YIELDS TO PRODUCE PROCESS TOMATOES (SDI)

	YIELD (TON)						
	29.00	34.00	39.00	44.00	49.00	54.00	59.00
OPERATING COSTS/ACRE:							
Preplant	160	160	160	160	160	160	160
Cultural	1,534	1,534	1,534	1,534	1,534	1,534	1,534
Harvest	655	733	812	891	970	1,049	1,128
Post-Harvest	79	79	79	79	79	79	79
Assessment	11	13	15	17	19	21	23
Interest on Operating Capital @ 5.75%	49	50	50	51	51	52	52
TOTAL OPERATING COSTS/ACRE	2,488	2,570	2,651	2,733	2,814	2,896	2,977
TOTAL OPERATING COSTS/TON	85.80	75.58	67.98	62.11	57.43	53.63	50.46
CASH OVERHEAD COSTS/ACRE	203	203	203	203	203	203	203
TOTAL CASH COSTS/ACRE	2,692	2,773	2,855	2,936	3,018	3,099	3,181
TOTAL CASH COSTS/TON	92.82	81.56	73.20	66.73	61.59	57.40	53.91
NON-CASH OVERHEAD COSTS/ACRE	223	223	223	223	223	223	223
TOTAL COSTS/ACRE	2,915	2,996	3,078	3,159	3,241	3,323	3,404
TOTAL COSTS/TON	101.00	88.00	79.00	72.00	66.00	62.00	58.00

Net Return per Acre above Operating Costs for Process Tomatoes (SDI)

PRICE ($/ton)	YIELD (Ton /acre)						
Tomatoes (SDI)	29.00	34.00	39.00	44.00	49.00	54.00	59.00
65.00	-603	-360	-116	127	371	614	858
70.00	-458	-190	79	347	616	884	1,153
75.00	-313	-20	274	567	861	1,154	1,448
80.00	-168	150	469	787	1,106	1,424	1,743
85.00	-23	320	664	1,007	1,351	1,694	2,038
90.00	122	490	859	1,227	1,596	1,964	2,333
95.00	267	660	1,054	1,447	1,841	2,234	2,628

Net Return per Acre above Cash Costs for Process Tomatoes (SDI)

PRICE ($/ton)	YIELD (Ton /acre)						
Tomatoes (SDI)	29.00	34.00	39.00	44.00	49.00	54.00	59.00
65.00	-807	-563	-320	-76	167	411	654
70.00	-662	-393	-125	144	412	681	949
75.00	-517	-223	70	364	657	951	1,244
80.00	-372	-53	265	584	902	1,221	1,539
85.00	-227	117	460	804	1,147	1,491	1,834
90.00	-82	287	655	1,024	1,392	1,761	2,129
95.00	63	457	850	1,244	1,637	2,031	2,424

TABLE 4. RANGING ANALYSIS CONTINUED

Net Return per Acre above Total Costs for Process Tomatoes (SDI)

PRICE ($/ton)	YIELD (Ton /acre)						
Tomatoes (SDI)	29.00	34.00	39.00	44.00	49.00	54.00	59.00
65.00	-1,030	-786	-543	-299	-56	187	431
70.00	-885	-616	-348	-79	189	457	726
75.00	-740	-446	-153	141	434	727	1,021
80.00	-595	-276	42	361	679	997	1,316
85.00	-450	-106	237	581	924	1,267	1,611
90.00	-305	64	432	801	1,169	1,537	1,906
95.00	-160	234	627	1,021	1,414	1,807	2,201

UC COOPERATIVE EXTENSION
TABLE 5. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS

ANNUAL EQUIPMENT COSTS

						Cash Overhead		
Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur-ance	Taxes	Total
14	Road Grader	75,000	25	2,122	5,143	320	386	5,848
14	#1 Irrigation Pipe Trailer	2,141	20	119	164	9	11	185
14	#2 Irrigation Pipe Trailer	2,141	20	119	164	9	11	185
14	Truck-Trailer Lowbed	95,000	15	18,495	8,125	470	567	9,163
14	Back Hoe	16,599	15	1,594	1,497	75	91	1,663
14	425 HP Crawler	340,000	10	100,431	35,420	1,826	2,202	39,448
14	200 HP Crawler	229,338	10	67,743	23,892	1,231	1,485	26,609
14	#1 155 HP2WD Tractor	158,066	10	46,690	16,467	849	1,024	18,339
14	#2 155 HP2WD Tractor	158,066	10	46,690	16,467	849	1,024	18,339
14	#1 130 HP2WD Tractor	123,000	10	36,332	12,814	660	797	14,271
14	#2 130 HP2WD High-Crop Tractor	123,000	10	36,332	12,814	660	797	14,271
14	Cultivator - Performer 3 Row	33,309	10	5,890	3,788	162	196	4,146
14	#1 Irrigation-Booster Pump	19,919	10	3,523	2,265	97	117	2,479
14	#2 Irrigation Booster Pump	19,919	10	3,523	2,265	97	117	2,479
14	Rice Roller 18'	15,552	10	2,750	1,768	76	92	1,936
14	Cultivator 3-Row Alloway	11,259	10	1,991	1,280	55	66	1,401
14	Ring Roller 26'	8,747	10	1,547	995	43	51	1,089
14	Cultivator- Sled 3 Row	5,478	10	969	623	27	32	682
14	#1 Trailer Dolly	1,596	10	301	180	8	9	197
14	#2 Trailer Dolly	1,596	10	301	180	8	9	197
14	Harvester-Tomato	450,000	8	10,000	67,866	1,907	2,300	72,073
14	Stubble Disc 18'	55,000	5	17,916	9,357	302	365	10,024
14	Finish Disc 25'	48,769	5	15,886	8,297	268	323	8,889
14	Water Truck	48,000	5	21,512	7,098	288	348	7,733
14	Subsoiler 16'-9 Shank	42,454	5	13,829	7,223	233	281	7,738
14	Service Truck	38,600	5	17,300	5,708	232	279	6,219
14	Drip Tape Extractor	30,000	5	9,772	5,104	165	199	5,468
14	3/4 Ton Pickup	28,000	5	12,549	4,140	168	203	4,511
14	Triplane-16'	24,478	5	7,973	4,165	135	162	4,461
14	Incorporator - 15'	24,345	5	7,930	4,142	134	161	4,437
14	#1 1/2 Ton Pickup	24,000	5	10,756	3,549	144	174	3,867
14	#2 1/2 Ton Pickup	24,000	5	10,756	3,549	144	174	3,867
14	#3 1/2 Ton Pickup	24,000	5	10,756	3,549	144	174	3,867
14	Mulcher-15'	20,507	5	6,680	3,489	113	136	3,738
14	6 Row Lister-30'	20,176	5	6,572	3,433	111	134	3,677
14	Vine Diverter	17,650	5	5,749	3,003	97	117	3,217
14	Furrow Chisel-3 Row	17,405	5	5,669	2,961	96	115	3,172
14	5-Row Shaper-Drip Tape Installer	16,117	5	5,250	2,742	89	107	2,937
14	Cultivator–Fertilizer Bar-3 Row	13,054	5	4,252	2,221	72	87	2,379
14	#1 ATV	6,499	5	2,913	961	39	47	1,047
14	#2 ATV	6,499	5	2,913	961	39	47	1,047
14	Vine Trimmer	5,280	5	1,835	877	29	36	943
14	ATV Spray System	4,017	5	1,308	683	22	27	732
14	#1 Spray Boom-25'	3,630	5	1,182	618	20	24	662
14	#2 Spray Boom-25'	3,630	5	1,182	618	20	24	662
14	#1 300 Gal Saddle Tank	3,218	5	1,048	547	18	21	587
14	#2 300 Gal Saddle Tank	3,218	5	1,048	547	18	21	587
14	#3 300 Gal Saddle Tank	3,218	5	1,048	547	18	21	587
14	#4 300 Gal Saddle Tank	3,218	5	1,048	547	18	21	587
	TOTAL	2,448,708	-	594,096	304,815	12,612	15,214	332,641
	60% of New Cost*	1,469,225	-	356,458	182,889	7,567	9,128	199,585

*Used to reflect a mix of new and used equipment

TABLE 5. CONTINUED

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insur-ance	Taxes	Repairs	
INVESTMENT								
Shop Building	125,000	25	7,217	8,492	548	661	722	10,423
Drip Irrigation System	630,000	25	2,520	43,532	2,622	3,163	2,500	51,816
Storage Building	47,500	20	2,911	3,641	209	252	586	4,688
Fuel Tanks & Pumps	25,240	20	1,263	1,943	110	133	50	2,236
Shop Tools	20,000	20	1,447	1,526	89	107	145	1,867
Implement Carrier	16,700	15	974	1,536	73	88	487	2,184
Truck-Bobtail-5th Wheel	45,000	15	2,766	4,132	198	239	417	4,986
GPS Sending Unit	5,895	10	590	707	27	32	100	866
GPS Receivers (2)	3,990	10	400	478	18	22	100	618
Closed Mix System	5,074	10	507	608	23	28	25	684
Sprinkler Pipe	113,235	10	11,324	13,576	516	623	1,716	16,431
Pipe Main Line 10" 1/2 Mile	53,784	10	5,378	6,448	245	296	1,479	8,468
Generators & Light (2)	17,526	5	3,505	3,383	87	105	100	3,675
Drip Tape	210,000	5	0	48,170	870	1,050	100	50,190
TOTAL INVESTMENT	1,318,944	-	40,802	138,172	5,636	6,799	8,527	159,134

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	700	Acre	1.50	1,050
Office Expense	700	Acre	50.00	35,000
Field Sanitation	700	Acre	0.75	525
Field Supervisor	700	Acre	85.00	59,500
Miscellaneous Costs (Training etc.)	700	Acre	20.00	14,000
Assistant Manager	700	Acre	21.00	14,700

UC COOPERATIVE EXTENSION
TABLE 6. HOURLY EQUIPMENT COSTS

		Process Tomatoes (SDI)	Total		Cash Overhead		Operating			
Yr	Description	Hours Used	Hours Used	Capital Recovery	Insur-ance	Taxes	Lube& Repairs	Fuel	Total Oper.	Total Costs/Hr.
14	#2 ATV	280	2000	0.29	0.01	0.01	1.81	3.93	5.74	6.05
14	Water Truck	233	2000	2.13	0.09	0.10	10.56	10.30	20.86	23.18
14	#1 ATV	117	2000	0.29	0.01	0.01	1.81	3.93	5.74	6.05
14	425 HP Crawler	273	1600	13.28	0.68	0.83	21.40	82.40	103.80	118.60
14	200 HP Crawler	222	1600	8.96	0.46	0.56	13.27	47.82	61.10	71.07
14	Harvester-Tomato	340	1250	32.58	0.92	1.10	158.92	82.40	241.32	275.92
14	#2 155 HP2WD Tractor	599	1200	8.23	0.42	0.51	12.92	37.06	49.98	59.15
14	#1 155 HP2WD Tractor	573	1200	8.23	0.42	0.51	12.92	37.06	49.98	59.15
14	#1 130 HP2WD Tractor	350	1200	6.41	0.33	0.40	10.39	31.08	41.47	48.61
14	#2 130 HP2WD High-Crop Tractor	282	1200	6.41	0.33	0.40	10.39	31.08	41.47	48.61
14	#1 Irrigation-Booster Pump	385	1000	1.36	0.06	0.07	1.29	8.24	9.53	11.02
14	#2 Irrigation Booster Pump	385	1000	1.36	0.06	0.07	1.29	8.24	9.53	11.02
14	Service Truck	350	1000	3.42	0.14	0.17	6.11	4.12	10.23	13.96
14	#1 Trailer Dolly	303	750	0.14	0.01	0.01	0.00	0.00	0.00	0.16
14	#2 Trailer Dolly	303	750	0.14	0.01	0.01	0.00	0.00	0.00	0.16
14	Vine Trimmer	128	600	0.88	0.03	0.04	1.19	0.00	1.19	2.14
14	Triplane-16'	38	600	4.16	0.13	0.16	3.82	0.00	3.82	8.29
14	#1 Irrigation Pipe Trailer	350	500	0.20	0.01	0.01	0.06	0.00	0.06	0.28
14	#2 Irrigation Pipe Trailer	350	500	0.20	0.01	0.01	0.06	0.00	0.06	0.28
14	#1 1/2 Ton Pickup	373	400	5.32	0.22	0.26	2.38	3.93	6.31	12.11
14	#2 1/2 Ton Pickup	373	400	5.32	0.22	0.26	2.38	3.93	6.31	12.11
14	#3 1/2 Ton Pickup	373	400	5.32	0.22	0.26	2.38	3.93	6.31	12.11
14	3/4 Ton Pickup	350	400	6.21	0.25	0.30	2.97	5.90	8.87	15.63
14	Incorporator - 15'	161	400	6.21	0.20	0.24	2.84	0.00	2.84	9.49
14	Cultivator-Fertilizer Bar-3 Row	161	400	3.33	0.11	0.13	2.93	0.00	2.93	6.50
14	Mulcher-15'	137	400	5.23	0.17	0.20	2.39	0.00	2.39	8.00
14	Road Grader	128	400	7.71	0.48	0.58	4.93	24.72	29.65	38.42
14	Furrow Chisel-3 Row	77	400	4.44	0.14	0.17	3.91	0.00	3.91	8.67
14	5-Row Shaper-Drip Tape Inserter	75	400	4.11	0.13	0.16	3.38	0.00	3.38	7.79
14	Drip Tape Extractor	70	400	7.66	0.25	0.30	6.29	0.00	6.29	14.50
14	Subsoiler 16'-9 Shank	61	400	10.83	0.35	0.42	9.90	0.00	9.90	21.50
14	Vine Diverter	49	400	4.50	0.15	0.18	3.13	0.00	3.13	7.95
14	Stubble Disc 18'	26	400	14.04	0.45	0.55	9.37	0.00	9.37	24.41
14	6 Row Lister-30'	15	400	5.15	0.17	0.20	4.23	0.00	4.23	9.75
14	Finish Disc 25'	14	400	12.45	0.40	0.48	8.31	0.00	8.31	21.64
14	#2 300 Gal Saddle Tank	241	300	1.09	0.04	0.04	0.88	0.00	0.88	2.05
14	#1 300 Gal Saddle Tank	218	300	1.09	0.04	0.04	0.88	0.00	0.88	2.05
14	ATV Spray System	117	300	1.37	0.04	0.05	1.10	0.00	1.10	2.56
14	#2 Spray Boom-25'	112	300	1.24	0.04	0.05	0.99	0.00	0.99	2.32
14	#4 300 Gal Saddle Tank	79	300	1.10	0.04	0.04	0.88	0.00	0.88	2.05
14	#3 300 Gal Saddle Tank	71	300	1.09	0.04	0.04	0.88	0.00	0.88	2.05
14	#1 Spray Boom-25'	38	300	1.24	0.04	0.05	0.99	0.00	0.99	2.32
14	Back Hoe	154	200	4.49	0.23	0.27	3.26	20.60	23.86	28.85
14	Cultivator- #2 Sled 3 Row	151	200	1.87	0.08	0.10	1.17	0.00	1.17	3.22
14	Cultivator 3-Row Alloway	96	200	3.84	0.16	0.20	2.41	0.00	2.41	6.62
14	Rice Roller 18'	88	200	5.31	0.23	0.27	1.78	0.00	1.78	7.59
14	Cultivator - #1 Performer 3 Row	72	200	11.36	0.49	0.59	6.85	0.00	6.85	19.28
14	Ring Roller 26'	14	200	2.98	0.13	0.15	1.00	0.00	1.00	4.27
14	Truck-Trailer Lowbed	117	133	36.66	2.12	2.56	11.30	15.45	26.75	68.09

UC COOPERATIVE EXTENSION
TABLE 7. OPERATIONS WITH EQUIPMENT & MATERIALS

Operation	Operation Month	Tractor	Implement	Labor Type/ Material	Rate/ acre	Unit
Laser level 4 % Ac	Oct			Laser Level	0.04	Acre
Chisel Furrows 80% Ac	Oct	200 HP Crawler	Furrow Chisel-3 Row	Equipment Operator Labor	0.13	hour
Condition Beds 80% Ac	Oct	200 HP Crawler	Cult - #1 Performer 3 Row	Equipment Operator Labor	0.12	hour
Stubble Disc & Roll 20%	Oct	425 HP Crawler	Stubble Disc 18'	Equipment Operator Labor	0.05	hour
			Rice Roller 18'			
Sub-Soil & Roll 20% Ac	Oct	425 HP Crawler	Subsoiler 16'-9 Shank			
			Rice Roller 18'			
Finish Disc & Roll 20%	Oct	200 HP Crawler	Finish Disc 25'	Equipment Operator Labor	0.02	hour
			Ring Roller 26'			
Land Plane 2X 20% Ac	Oct	200 HP Crawler	Triplane-16'	Equipment Operator Labor	0.06	hour
Gypsum 20% Ac	Oct			Gypsum-Hauled Spread	0.60	Ton
List Beds 6-Row 20% Ac	Nov	425 HP Crawler	6 Row Lister-30'	Equipment Operator Labor	0.03	hour
5-Row Shape/Insert Tape	Nov	425 HP Crawler	5-Row Shaper-Drip Tape Inserter	Non-Machine Labor	1.00	hour
Pest Control-Weeds	Jan		ATV	Equipment Operator Labor	0.10	hour
				Roundup UltraMax	1.50	Pint
			ATV Spray System	Goal 2XL	8.00	FlOz
Pest Control-Weeds	Mar		ATV	Equipment Operator Labor	0.10	hour
				Roundup UltraMax	1.50	Pint
			ATV Spray System			
Open Beds-3 Row	Mar	130 HP2WD Tractor	Cultivator 3-Row Alloway	Equipment Operator Labor	0.17	hour
Mulch Beds-Apply Herb	Mar	155 HP2WD Tractor	300 Gal Saddle Tank	Equipment Operator Labor	0.12	hour
				Triflurex HFP	0.50	Pint
			Mulcher-15'	Dual II Magnum	0.67	Pint
	May	155 HP2WD Tractor	300 Gal Saddle Tank	Equipment Operator Labor	0.12	hour
				Dual II Magnum	0.67	Pint
			Mulcher-15'	Triflurex HFP	0.50	Pint
Fertilize-Starter	Mar	155 HP2WD Tractor	300 Gal Saddle Tank	Equipment Operator Labor	0.14	hour
				8-24-6, 2% Zn	4.00	Lb/N
			Cultivator - 3 Row			
	May	155 HP2WD Tractor	300 Gal Saddle Tank	Equipment Operator Labor	0.14	hour
				8-24-6, 2% Zn	4.00	Lb/N
			Cultivator - 3 Row			
Transplant Tomatoes	Apr			Transplanting	4.40	Thou
				Tomato Seed Thou	5.01	Thou
				Transplants-Growing	4.36	Thou
	May			Transplanting	4.40	Thou
				Tomato Seed Thou	5.01	Thou
				Transplants-Growing	4.36	Thou
Pest Control-Weeds	Apr	130 HP2WD Tractor	300 Gal Saddle Tank	Equipment Operator Labor	0.05	hour
				Matrix DF	0.25	Oz
			Spray Boom-25'			
	May	130 HP2WD Tractor	300 Gal Saddle Tank	Equipment Operator Labor	0.05	hour
				Matrix DF	0.25	Oz
			Spray Boom-25'			
Irrigate-Sprinklers	Apr		Irrigation-Booster Pump	Equipment Operator Labor	0.60	hour
				Water Average Costs	1.00	AcIn
			Irrigation Pipe Trailer			
	May		Irrigation Booster Pump	Equipment Operator Labor	0.60	hour
				Water Average Costs	1.00	AcIn
			Irrigation Pipe Trailer			
Irrigate-Drip	Apr			Water Average Costs	2.00	AcIn
	Apr			Water Average Costs	2.00	AcIn
	May			Water Average Costs	2.00	AcIn
	May			Water Average Costs	3.00	AcIn
	June			Water Average Costs	6.00	AcIn
	July			Water Average Costs	8.00	AcIn
	Aug			Water Average Costs	5.00	AcIn
Pest Control-Weeds	Apr	130 HP2WD Tractor	Cultivator- #2 Sled 3 Row	Equipment Operator Labor	0.13	hour
	May	130 HP2WD Tractor	Cultivator- #2 Sled 3 Row	Equipment Operator Labor	0.13	hour
Fertigation-UN 32	Apr			UN-32	50.00	Lb N
	May			UN-32	50.00	Lb N
	June			UN-32	50.00	Lb N
	July			UN-32	50.00	Lb N
Pest Control-Weeds	May			Thin & Hoe	0.40	Acre
	June			Thin & Hoe	0.40	Acre
Pest Control-Weeds	May	155 HP2WD Tractor	300 Gal Saddle Tank	Equipment Operator Labor	0.14	hour
				Triflurex HFP	0.50	Pint
			Incorporator - 15'			
	June	155 HP2WD Tractor	300 Gal Saddle Tank	Equipment Operator Labor	0.14	hour
				Triflurex HFP	0.50	Pint

TABLE 7. OPERATIONS WITH EQUIPMENT & MATERIALS CONTINUED

Operation	Operation Month	Tractor	Implement	Labor Type/ Material	Rate/ acre	Unit
			Incorporator - 15'			
Pest Control-Bacteria	May	130 HP2WD Tractor	300 Gal Saddle Tank	Equipment Operator Labor	0.01	hour
				Kocide DF	0.38	Lb
			Spray Boom-25'			
	June	130 HP2WD Tractor	300 Gal Saddle Tank	Equipment Operator Labor	0.01	hour
				Kocide DF	0.38	Lb
			Spray Boom-25'			
Pest Control-Aphids	June	130 HP2WD HC	300 Gal Saddle Tank	Equipment Operator Labor	0.02	hour
				Warrior II	0.38	FlOz
			Spray Boom-25'			
Pest Control-Late Blight	June	130 HP2WD HC	300 Gal Saddle Tank	Equipment Operator Labor	0.00	hour
				Bravo Weatherstik	0.10	Pint
			Spray Boom-25'			
Trim Vines	July	130 HP2WD HC	Vine Trimmer	Equipment Operator Labor	0.11	hour
	Aug	130 HP2WD HC	Vine Trimmer	Equipment Operator Labor	0.11	hour
Pest Control-Mites	July			Air App Dusting	1.20	Lb
				Sulfur DF	1.20	Lb
				Air App Spray 10g	0.20	acre
	Aug			Air App Dusting	1.20	Lb
				Sulfur DF	1.20	Lb
				Air App Spray 10g	0.20	Acre
Irrigation Labor	Aug			Irrigation Labor	8.00	hours
Pest Control-Fruit Rot	Sept	130 HP2WD HC	300 Gal Saddle Tank	Equipment Operator Labor	0.01	hour
				Bravo Weatherstik	0.30	Pint
			Spray Boom-25'			
Pest Control-Worms	Sept	130 HP2WD HC	300 Gal Saddle Tank	Equipment Operator Labor	0.09	hour
				Confirm	10.00	FlOz
			Spray Boom-25'			
Fruit Ripener-Ethrel	Sept	130 HP2WD HC	300 Gal Saddle Tank	Equipment Operator Labor	0.00	hour
				Ethrel	0.20	Pint
			Spray Boom-25'			
Service Truck	Sept		Service Truck	Equipment Operator Labor	0.60	hour
Water Truck	Sept		Water Truck	Equipment Operator Labor	0.40	hour
Back Hoe	Sept		Back Hoe	Equipment Operator Labor	0.24	hour
Road Grader	Sept		Road Grader	Equipment Operator Labor	0.20	hour
Truck-Lowbed Trailer	Sept		Truck-Trailer Lowbed	Equipment Operator Labor	0.20	hour
1/2 Ton Pickup (3)	Sept		#1 1/2 Ton Pickup	Equipment Operator Labor	0.64	hour
	Sept		#2 1/2 Ton Pickup	Equipment Operator Labor	0.64	hour
	Sept		#3 1/2 Ton Pickup	Equipment Operator Labor	0.64	hour
3/4 Ton Pickup (2)	Sept		#1 3/4 Ton Pickup	Equipment Operator Labor	0.60	hour
Pest Control-Vertebrate	Sept		#2 ATV	Non-Machine Labor	0.25	hour
				Zinc Phosphide	0.50	Lb
				Gopher Trap	0.50	Each
Harvest Custom 50% Ac	Aug			Harvest	22.00	Ton
Open Harvest Lanes	Sept	130 HP2WD HC	Vine Diverter	Equipment Operator Labor	0.08	hour
Harvest Self 50% Ac	Sept		Harvester-Tomato	Non-Machine Labor	1.44	hours
In Field Hauling (2)	Sept	155 HP2WD Tractor	Trailer Dolly	Equipment Operator Labor	0.52	hour
	Sept	155 HP2WD Tractor	Trailer Dolly	Equipment Operator Labor	0.52	hour
Share Rent 12.0%	Sept			Share Rent 12.0%	44.00	Tons
Irrigation-Drip	Sept			Infuric Acid	0.12	Gal
				Water Average Costs	0.50	AcIn
Drip Tape System Maint	Sept		ATV	Non-Machine Labor	3.55	hours
Drip Tape Extraction	Sept	425 HP Crawler	Drip Tape Extractor	Non-Machine Labor	0.60	hour