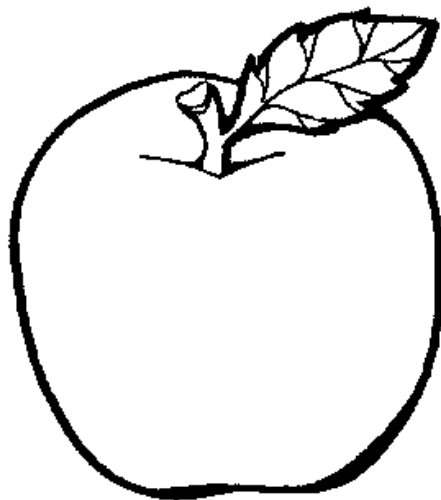

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2001

**SAMPLE COSTS TO ESTABLISH AN
APPLE ORCHARD AND PRODUCE**

APPLES

Granny Smith Variety



SAN JOAQUIN VALLEY-NORTH

Micro-Sprinkler Irrigation

Prepared by:

Janet L. Caprile	UC Cooperative Extension Farm Advisor, Contra Costa County
Joseph A. Grant	UC Cooperative Extension Farm Advisor, San Joaquin County
Brent A. Holtz	UC Cooperative Extension Farm Advisor, Madera County
Kathleen M. Kelley	UC Cooperative Extension Farm Advisor, Stanislaus County
Elizabeth J. Mitcham	UC Cooperative Extension Associate Specialist, Department of Pomology, UC Davis
Karen M. Klonsky	UC Cooperative Extension Specialist, Department of Agricultural and Resource Economics, UC Davis
Richard L. De Moura	UC Cooperative Extension Staff Research Associate, Department of Agricultural and Resource Economics, UC Davis

University of California Cooperative Extension

Sample Costs to Establish an Apple Orchard and Produce Apples San Joaquin Valley – North 2001

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Introduction

Sample costs to establish an apple orchard and produce apples in the Northern San Joaquin Valley are shown in this study. The study is intended as a guide only, and can be used to make production decisions, determine potential returns, prepare budgets and evaluate production loans. Practices described are based on the production practices considered typical for this crop and area but will not apply to every situation. Sample costs for labor, materials, equipment and custom services are based on current figures. A “*Your Costs*” column in Tables 2 and 3 is provided to enter your costs.

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

Sample Cost of Production Studies are available for many commodities and can be requested through the Department of Agricultural and Resource Economics, UC Davis, (530) 752-1515. Current studies can be downloaded from the department website <http://coststudies.ucdavis.edu> or obtained from the local county UC Cooperative Extension offices.

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Assumptions

The following assumptions pertain to sample costs to establish an apple orchard and to produce apples in the Northern San Joaquin Valley region. Practices described are not recommendations by the University of California, but represent production practices and materials considered typical of a well managed orchard. Some costs, practices, and materials may not be applicable to your situation or used during every year. Additional ones not indicated may be needed. Establishment and cultural practices vary by grower and region; variations can be significant. The costs shown are on an annual, per acre basis. *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 farm consists of 80 contiguous acres of land. An apple orchard is being established on 20 acres, other fruit and/or nut crops are planted on 55 acres, and field roads and farmstead are on five acres.

Establishment Cultural Practices and Material Inputs

Establishment cultural practices and material input assumptions refer to years 1 through 5 in Table 1.

Land Preparation. The orchard is established on ground previously planted to field or row crops. The site is ripped in two directions to break up the soil layers to a three-foot depth followed by three passes with a stubble disc. The site is then leveled and smoothed with a triplane. Orchards established on previous orchard land will have orchard removal costs of approximately \$400 per acre and fumigation costs of \$1,600 plus per acre. Because of changing fumigation regulations and material availability, the cost was not included in the study.

Trees. Granny Smith is the apple variety planted in this study. This variety accounts for approximately 11% of the acreage and 16% of the apple crop in the Northern San Joaquin Valley. The trees are planted on 16' X 8' spacing for a total of 340 trees per acre. The life of the orchard at planting is estimated to be 20 years.

Planting. The orchard is laid out, holes dug with a tractor mounted auger/post hole digger, trees planted, and the trunks wrapped with protective wrap (milk cartons) to protect the trunks from sunburn, herbicides and rodents. Five trees per acre are replanted in the second year. All operations preparing the ground for planting are done in the year prior to planting, but are charged to the first establishment year. Layout and planting are done by contractors in the spring following ground preparation.

Irrigation. Water for irrigation is pumped from a well. Price per acre-foot for pumped water will vary among growers within the region depending on well characteristics and irrigation district. In this study, water is calculated to cost \$37.80 per acre-foot or \$3.15 per acre-inch. No assumption is made about effective rainfall. The amount of water used by the orchard during its establishment period increases each year and is shown in Table A.

Year	Applied water <small>acre inch</small>
1	18
2	24
3	30
4	36

Pruning. Beginning in January of the second year, the trees are dormant pruned. The prunings are placed in the row centers and shredded. During the summer of the second, third, and fourth years, the trees are pruned for shaping and fireblight control. To prevent contamination during summer pruning, the equipment is sterilized as the trees are trimmed, and the prunings are pushed to the end of the orchard and burned.

Fertilization. Nitrogen fertilizer is applied through the irrigation system. As the trees grow, the amount required increases each year and is shown in Table B. Zinc chelate at 2 pounds per acre is applied as a single foliar spray in the first and second year. Beginning in the third year, the zinc is included with the first or second codling moth (CM) spray.

Year	Pounds of N/Acre
1	20
2	40
3	60
4+	80

Pest Management. The pesticides and rates mentioned in this cost study are listed in UC *Integrated Pest Management Guidelines, Apples*. Written recommendations are required for many pesticides, and are made by licensed pest control advisors.

Weeds. Prior to planting, preemergent herbicides Surflan and Goal are applied to the marked tree row, a six-foot wide strip/berm. Beginning the first year, 30% of the tree row strip is spot sprayed with the contact herbicide Roundup. In the fall of the first year and continuing each year thereafter, the tree rows are treated with the preemergent and contact herbicides. The row middles are mowed five times per year for weed control throughout the life of the orchard.

Insects. Disease, insect, and mite treatments begin in the second year with a delayed dormant application of supreme oil and Diazinon. Beginning in the third year, codling moth is controlled with two applications of Imidan in May, a Guthion application in June and an Imidan application in August. In the fourth year, Agrimek for mites and leafminers control is tank mixed with the first or second codling moth spray.

Diseases. Two spring sprays with Rally for scab and mildew control plus Streptomycin for fireblight control are applied beginning in the third year.

Fruit Thinning. Fruit thinning begins in the fourth year. Chemical thinning is used in this study with a Sevin application. Some growers will thin by hand or use a combination of chemical and hand thinning.

Harvest. Harvest begins in the third year. See harvest, packinghouse, yields, and returns section under Production Cultural Practices and Material Inputs.

Production Cultural Practices and Material Inputs

Production cultural practices and material input assumptions refer to Tables 2 to 7. The study assumes that in year 6, the orchard has reached maturity and maximum production.

Pruning. Pruning is done by hand during the winter months, January and February in this study. The prunings are placed in the row middles and shredded. Summer pruning for fireblight control may be required, but is not included in this study. The fireblight pruning costs will vary according to the amount of infection.

Estimated pruning cost are a \$1.45 per tree which includes pruning labor at \$0.60 per tree, and the cost of pruning shears, brush removal and burning, and bleach for sterilizing the shears at \$0.85 per tree.

Fertilization. Nitrogen fertilizer at 80 pounds of N per acre is applied through the irrigation system in equal amounts in April, May, June, and July. Zinc chelate at two pounds per acre is mixed with the first or second May codling moth spray. Calcium Nitrate for bitter pit control is applied in equal amounts (10 lb/application) with the four CM sprays.

Irrigation. Water for irrigation is pumped from a well. Price per acre-foot for pumped water will vary among growers. In this study, water is calculated to cost \$37.80 per acre-foot or \$3.15 per acre-inch. No assumption is made about effective rainfall. A total of 36 acre-inches is applied to the orchard from April through September. The September irrigation is post-harvest.

Pest Management. The pesticides and rates mentioned in this cost study are listed in UC *Integrated Pest Management Guidelines, Apples*. For more information on other pesticides available, pest identification, monitoring, and management visit the UC IPM website at www.ipm.ucdavis.edu. Written recommendations are required for many pesticides, and are made by licensed pest control advisors. For information on pesticide use permits, contact the local county agricultural commissioner's office.

Weeds. Weeds are controlled in the row centers during the season with five mowings. In the winter the berms/tree rows are sprayed with the preemergent herbicides, Surflan and Goal and the contact herbicide, Roundup. During the summer, a 'spot spray' using the contact herbicide is applied to approximately 30% of the tree row acres.

Insects. A delayed dormant spray with supreme oil and Diazinon is applied in March to control aphids and mites. Codling moth is controlled with two applications of Imidan in May, a Guthion application in June and an Imidan application in August. The insecticide, Agrimek, is added to the first or second CM spray in May to control mite and leafminers.

Diseases. Two sprays with Rally for scab and mildew control plus Streptomycin for fireblight control are applied in the spring. Growers should monitor the orchard for fireblight strikes. Pruning for fireblight (see Pruning) is not included in this study.

Fruit Thinning. Chemical thinning is done with an application of Sevin XLR. Some growers may also do hand thinning, but is not included in this study.

Harvest. In this cost study the crop is harvested in one pick by the grower's picking crew. The pickers pick from ground level into bags. The bags are dumped into one-half ton field bins on bin trailers. The bins are furnished by the packinghouse and hold approximately 800 pounds of fruit. The filled bins are taken to the "staging area" where they are loaded by the grower's tractor equipped with rear forks and loaded on a flatbed trailer or truck. Harvesting costs will vary depending on yield and methods of harvest.

Packinghouse. The grower delivers the fruit to the packing shed, where the fruit is sorted, packed and stored until sale. Packing shed costs vary slightly. In this study, the grower pays \$6.50 per 40-lb box or \$325 per ton which includes cooling, sorting, boxes, pallets and one month storage. The packinghouse charges a \$10 per ton handling fee for processing fruit. An 8% selling commission is charged by the packing shed for selling the fresh and processed fruit, but is not included in this study.

Year	Tons/Acre
3	8
4	14
5	25
6+	30

Yields. Typical annual yields for Granny Smith varieties are measured in tons per acre and are shown in Table C. A portion of the crop sent to the packinghouse is packed for fresh market. The apples not meeting fresh market standards are culled and sent to processing as peelers and juicers. Average yield breakdown is 70% fresh market and 30% processing (20% peelers plus 10% juicers).

Returns. An estimated price of \$14 per box or \$700 per ton for fresh apples, \$75 per ton for peelers, and \$50 per ton for juice apples are used to calculate returns in this study. Based on the above prices and yield breakdown of 70% fresh, 20% peelers, 10% juicers, the calculated overall return is \$510 per ton. The Table 7 ranging analysis uses the overall price, because there is not a direct relationship between fresh market and processing returns.

Labor. Hourly wages for workers are \$9.00 for skilled labor and \$6.75 per hour for field workers. Adding 34% for the employer’s share of federal and state payroll taxes, insurance, and other possible benefits gives the labor rates shown of \$12.06 per hour and \$9.05 per hour. Labor for operations involving machinery are 20% higher than the operation time given in Table 2 to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and repair.

Risk. The risks associated with producing and marketing apples are significant. While this study makes every effort to model a production system based on typical, real world practices, it cannot fully represent financial, agronomic and market risks which affect the profitability and economic viability of apple production. Crop insurance is a risk management tool available to growers.

Overhead Costs

Overhead costs refer to Tables 1 to 7. The costs are calculated for the production years and therefore do not accurately represent the establishment years.

Cash Overhead. Cash overhead consists of various cash expenses paid out during the year that are assigned to the whole farm and not to a particular operation. These costs include property taxes, interest on operating capital, office expense, liability and property insurance, sanitation services, and investment repairs.

Property Taxes. Counties charge a base property tax rate of 1% on the assessed value of the property, which includes equipment, buildings, trees, and improvements. In some counties special assessment districts exist and charge additional taxes. For this study, county taxes are calculated as 1% of the average value of the property. Average value equals new cost plus salvage value divided by 2 on a per acre basis.

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 10.51% 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 0.666% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$509 for the entire farm.

Office Expense. Office and business expenses are estimated at \$50 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, road maintenance, utilities, and miscellaneous overhead items.

Sanitation Services. Sanitation services provide portable washing and toilet units for the orchard and cost the farm \$108 per month for a single toilet and washing unit. The units are rented for six months and the cost includes delivery and weekly servicing of the units.

Management/Supervisor Salaries. Wages for management are not included as a cash cost. Any return above total costs is considered a return to management and risk.

Capital Recovery Costs. Farm equipment on apple orchards in the region is purchased new or used. 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 Tables 3 and 5. The capital recovery cost for investments are on an annual per acre basis.

Capital Recovery Costs. Capital recovery cost is the annual depreciation and interest costs for a capital investment and is the amount of money required each year to recover the difference between the purchase price and salvage value (unrecovered capital). The capital recovery costs are equivalent to the annual payment on a loan for the investment with the down payment equal to the discounted salvage value. This is a more complex method of calculating ownership costs than straight-line depreciation and opportunity costs, but more accurately represents the annual costs of ownership because it takes the time value of money into account (Boehlje and Eidman). The formula for the calculation of the annual capital recovery costs is $((\text{Purchase Price} - \text{Salvage Value}) \times \text{Capital Recovery Factor}) + (\text{Salvage Value} \times \text{Interest Rate})$.

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery the remaining value is a percentage of the new cost of the investment (Boehlje and Eidman). The percent remaining value is calculated from equations developed by the American Society of Agricultural Engineers (ASAE) based on equipment type and years of life. The life in years is estimated by dividing the wear out life, as given by ASAE by the annual hours of use in the 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 and equipment life.

Interest Rate. The interest rate of 6.70% used to calculate capital recovery cost is the USDA-ERS's ten-year average of California's agricultural sector long-run rate of return to production assets from current income. It is used to reflect the long-term realized rate of return to these specialized resources that can only be used effectively in the agricultural sector. In other words, the next best alternative use for these resources is in another agricultural enterprise.

Land. The study covers a range of regions; therefore land values will vary considerably. In this study land is valued at \$5,000 per acre or \$5,333 per producing acre based on the average value of row cropland in the regions.

Irrigation System. A well and surface water was already available and is not included in the cost. The sprinkler system cost is based on a low volume microsprinkler system, installed after planting. The sprinkler heads are located in the tree row. The cost of the irrigation system is based on a 75 horsepower electric pump that is available for use on the entire farm. The water is pumped from a well depth of 115 feet through a filtration system and into the sprinkler system. A pressure of 50 psi is maintained at the pump at an 85% irrigation efficiency. The life of the sprinkler irrigation system is estimated at 15 years and the pumping system at 20 years.

Establishment Costs. Costs to establish the orchard are used to determine capital recovery expenses, depreciation, and interest on investment, during the production years. The establishment cost is the sum of cash costs for land preparation, planting, trees, production expenses, and cash overhead for growing apples less returns through the first year fruit is harvested. The Total Accumulated Net Cash Cost in the third year shown in Table 1 represents the establishment cost per acre. For this study, the cost is \$4,436 per acre or \$88,720 for the entire orchard. The orchard establishment cost is amortized over the remaining 17 years of the 20-year orchard life.

Equipment. 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. The fuel, lube, and repair cost per acre for each operation in Table 2 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, travel and down time.

Repairs, Fuel and Lube. Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by the American Society of Agricultural Engineers (ASAE). Fuel and lubrication costs are also determined by ASAE equations based on maximum PTO horsepower, and fuel type. The on-farm delivery fuel price is \$1.26 per gallon for diesel and \$1.51 per gallon for gasoline.

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

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For information concerning the above mentioned University of California publications contact UC DANR Communications Services at 1-800-994-8849, online at <http://danrcs.ucdavis.edu> or your local county UC Cooperative Extension office.

U.C. COOPERATIVE EXTENSION

**Table 1. SAMPLE COSTS PER ACRE TO ESTABLISH AN APPLE ORCHARD
SAN JOAQUIN VALLEY NORTH - 2001**

	YEAR:	Cost Per Acre				
		1st	2nd	3rd	4th	5th
YIELD (ton/acre):		0	0	8	14	25
Planting costs:						
Land Preparation - Rip 2X		350				
Land Preparation - Disc 3X		11				
Land Preparation - Triplane 3X		125				
Weed - Spray Tree Row 6 ft width		23				
Orchard Layout		85				
Tree Cost		1,870	28	11	6	
Dig, Plant, Wrap, Top Trees (Replant 5 In 2nd Year)		406	6	2	1	
Stake/Prune (cut back) Trees		97	1	0	0	
TOTAL PLANTING COSTS		2,967	35	13	7	0
Cultural Costs:						
Prune - Dormant			79	237	447	484
Brush Disposal			2	2	2	2
Prune - Summer Fireblight Control			285	285	285	
Brush Removal & Burn			15	15	15	
Irrigate	77	102	121	143	144	
Fertilizer N with irrigations	8	16	23	31	31	
Fertilizer Calcium Nitrate w/CM Sprays			5	5	5	
Fertilizer Zinc 3rd + years w/2d CM Spray	7	7	1	1	1	
Insect Control - Codling Moth 4X			166	166	166	
Insect Control - Leafminer/mites w/ 1st CM Spray				77	77	
Insect Control - Delayed Dormant			22	34	44	
Disease Control - Scab/Mildew/Blight 2X				98	98	
Vertebrate Pest Control - Gopher	16	16	16	16	16	
Thin Fruit w/chemicals				22	22	
Weed Control - Mow 5X	21	21	21	21	21	
Weed Control - Spot Spray Strip	6	6	6	6	6	
Weed Control - Dormant Strip	22	22	22	22	22	
Pollination			50	75	100	
Leaf Analysis			3	3	3	
Pickup	110	110	110	110	110	
TOTAL CULTURAL COSTS		267	703	1,217	1,589	1,352
Harvests Costs:						
Pick			400	680	1,230	
Load & Haul			119	209	246	
TOTAL HARVEST COSTS		0	0	519	889	1,476
Packinghouse Costs:						
Cool, Sort, Pack, Storage (Fresh)			1,820	3,185	5,688	
Handling, Storage (Processing)			24	42	75	
TOTAL PROCESSING COSTS			1,844	3,227	5,763	
Interest on operating capital @ 10.51%	264	30	68	103	126	
TOTAL OPERATING COSTS/ACRE	3,498	768	3,661	5,815	8,717	
Cash Overhead Costs:						
Office Expense	50	50	50	50	50	
Sanitation Fees	9	9	9	9	9	
Property Taxes	65	66	68	69	69	
Liability Insurance	6	6	6	6	6	
Property Insurance	43	44	45	46	46	
Investment Repairs	21	21	21	21	21	
TOTAL CASH OVERHEAD COSTS	194	196	199	201	201	
TOTAL CASH COSTS	3,692	964	3,860	6,016	8,918	
INCOME FROM PRODUCTION	0	0	4,080	7,140	12,750	
NET CASH COSTS FOR THE YEAR	3,692	964	0	0	0	
PROFIT/ACRE ABOVE CASH COSTS	0	0	220	1,124	3,832	
TOTAL ACCUMULATED NET CASH COSTS	3,692	4,656	4,436	3,312	0	

U.C. COOPERATIVE EXTENSION
Table 1. continued

Year	Cost Per Acre				
	1st	2nd	3rd	4th	5th
Yield: Field Run - Tons Per Acre	0	0	8	14	25
Non-cash Overhead (Capital Recovery):					
Land	357	357	357	357	357
Shop Building	18	18	18	18	18
Shop Tools	11	11	11	11	11
Irrigation System Pump Filters	18	18	0	0	0
Irrigation System Sprinkler	108	108	108	108	108
Fuel Tanks and Pumps	24	24	24	24	24
Equipment	55	70	113	126	128
TOTAL CAPITAL RECOVERY	591	606	649	662	664
TOTAL COST/ACRE FOR THE YEAR	4,283	1,570	4,509	6,678	9,582
INCOME/ACRE FROM PRODUCTION	0	0	4,080	7,140	12,750
TOTAL NET COST/ACRE FOR THE YEAR	4,283	1,570	429	0	0
NET PROFIT/ACRE ABOVE TOTAL COST	0	0	0	462	3,168
TOTAL ACCUMULATED NET COST/ACRE	4,283	5,853	6,282	5,820	2,652

UC COOPERATIVE EXTENSION
Table 2. COST PER ACRE TO PRODUCE APPLES
 SAN JOAQUIN VALLEY - NORTH 2001

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per Acre				Total Cost	Your Cost
		Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent		
Cultural:							
Prune-Dormant	52.00	484	0	0	0	484	
Brush Disposal	0.10	1	1	0	0	2	
Disease/Insects-Delayed Dormant Spray	0.23	3	2	38	0	44	
Pollination Feb Mar Apr	0.00	0	0	0	125	125	
Thin w/Chemical	0.34	5	3	13	0	22	
Pest Control - Gophers	0.50	7	3	5	0	16	
Disease Scab/Mildew/Fireblight 2X	0.69	10	6	82	0	98	
Insect Control-Codling Moth (CM)	1.38	20	13	133	0	166	
Fertilize Zinc w/2d CM Spray	0.00	0	0	1	0	1	
Fertilize CaNO3 w/CM Spray	0.00	0	0	5	0	5	
Insect Mite Leafminer w/1stCM Spray	0.00	0	0	77	0	77	
Irrigate 8X	3.24	30	0	113	0	144	
Fertilize-Nitrogen with irrigations	0.00	0	0	31	0	31	
Leaf Analysis	0.10	1	0	0	2	3	
Weed Control-Mow 5X	0.92	13	7	0	0	21	
Weed Control- Winter Strip Spray	0.18	3	1	18	0	22	
Weed Control 30% Strip acres (spot spray)	0.22	3	2	1	0	6	
Pickup Truck Use	5.33	77	33	0	0	110	
TOTAL CULTURAL COSTS	65.22	658	71	520	127	1,376	
Harvest:							
Harvest	158.53	1,476	0	0	0	1,476	
Load Bins	7.88	114	47	0	0	161	
Haul Bins	5.00	72	31	0	0	103	
TOTAL HARVEST COSTS	171.41	1,662	78	0	0	1,740	
Packinghouse:							
Cool, Sort, Pack, Store (Fresh)	0.00	0	0	0	6,825	6,825	
Handle, Store (Processing)	0.00	0	0	0	90	90	
TOTAL PROCESSING COSTS	0	0	0	0	6,915	6,915	
Interest on operating capital @ 10.51%						151	
TOTAL OPERATING COSTS/ACRE		2,320	149	520	7,042	10,183	
TOTAL OPERATING COSTS/TON						339	
Cash Overhead:							
Office Expense						50	
Liability Insurance						6	
Sanitation Fees						9	
Property Taxes						91	
Property Insurance						25	
Investment Repairs						21	
TOTAL CASH OVERHEAD COSTS						202	
TOTAL CASH COSTS/ACRE						10,385	
TOTAL CASH COSTS/TON						346	
Non-cash Overhead:							
		Per producing Acre		Annual Cost Capital Recovery			
Buildings		200		18		18	
Fuel Tanks & Pumps		264		24		24	
Shop Tools		47		5		5	
Land		5,333		357		357	
Irrigation Sprinkler		1,000		108		108	
Irrigation 75 hp Pump Filter System		200		18		18	
Establishment Costs		4,436		445		445	
Hand Tools		61		6		6	
Equipment		1,148		150		133	
TOTAL NON-CASH OVERHEAD COSTS		12,570		1,115		1,131	
TOTAL COSTS/ACRE						11,500	
TOTAL COSTS/TON						383	

UC COOPERATIVE EXTENSION

**Table 3. COSTS AND RETURNS PER ACRE TO PRODUCE APPLES
SAN JOAQUIN VALLEY - NORTH 2001**

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Fresh Market	21.00	ton	700.00	14,700	
Processing-Peelers	6.00	ton	75.00	450	
Processing-Juicers	3.00	ton	50.00	150	
TOTAL GROSS RETURNS	30.00	ton	*510.00	15,300	
OPERATING COSTS					
Custom:					
Hives-each	5.00	each	25.00	125	
Leaf Analysis	1.00	acre	2.00	2	
Cool,Sort, Pack (Fresh)	21.00	ton	325.00	6,825	
Handle, Store (Process)	9.00	ton	10.00	90	
Fertilizer:					
UN-32	80.00	lb N	0.39	31	
Zinc Chelate 6%	2.00	lb	0.63	1	
Calcium Nitrate	40.00	lb	0.13	5	
Insecticide:					
Supreme Oil	7.00	gal	2.80	20	
Diazinon 50W	4.00	lb	5.37	21	
Imidan 70WSB	15.00	lb	7.55	113	
Guthion Solupak 50	2.00	lb	9.95	20	
Agri-Mek 0.15 EC	11.00	floz	6.78	75	
Fungicide:					
Rally	8.00	oz	4.46	36	
Agrimycin 17	32.00	oz	1.44	46	
Rodenticide:					
Rodent Bait	2.00	lb	2.74	5	
Thin Aide:					
Sevin XLR	3.00	pint	4.49	13	
Herbicide:					
Roundup Ultra	0.54	pt	6.06	3	
Surflan 4 AS	0.63	pt	11.98	8	
Goal 2 XL	0.63	pt	13.32	8	
Water:					
Water	36.00	acin	3.15	113	
Labor (machine)	27.31	hrs	12.06	329	
Labor (non-machine)	213.87	hrs	9.31	1,991	
Fuel - Gas	23.35	gal	1.51	35	
Fuel - Diesel	36.89	gal	1.26	46	
Lube				12	
Machinery repair				55	
Interest on operating capital @ 10.51%				151	
TOTAL OPERATING COSTS/ACRE				10,183	
TOTAL OPERATING COSTS/TON				339	
NET RETURNS ABOVE OPERATING COSTS				5,117	
CASH OVERHEAD COSTS:					
Office Expense				50	
Liability Insurance				6	
Sanitation Fees				9	
Property Taxes				91	
Property Insurance				25	
Investment Repairs				21	
TOTAL CASH OVERHEAD COSTS/ACRE				202	
TOTAL CASH COSTS/ACRE				10,385	
TOTAL CASH COSTS/TON				346	

U.C. COOPERATIVE EXTENSION

Table 3. Continued

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Buildings				18	
Fuel Tanks & Pumps				24	
Shop Tools				5	
Land				357	
Irrigation Sprinkler				108	
Irrigation 75 hp Pump Filter System				18	
Establishment Costs				445	
Hand Tools				6	
Equipment				133	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				1,115	
TOTAL COSTS/ACRE				11,500	
TOTAL COSTS/TON				383	
NET RETURNS ABOVE TOTAL COSTS				3,800	
*Weighted average					

UC COOPERATIVE EXTENSION
Table 4. MONTHLY CASH COST TO PRODUCE APPLES
 SAN JOAQUIN VALLEY - NORTH 2001

Beginning JAN 01 Ending DEC 01	JAN 01	FEB 01	MAR 01	APR 01	MAY 01	JUN 01	JUL 01	AUG 01	SEP 01	OCT 01	NOV 01	DEC 01	TOTAL
Cultural:													
Dormant Prune	484												484
Brush Disposal		2											2
Delayed Dormant Spray			44										44
Pollination Feb Mar Apr		125											125
Mow 5X				4	4	4	4	4					21
Fertilize-Nitrogen @ irrigation				8	8	8	8						31
Disease Scab/Mildew/Fireblight			49	49									98
Pest Control - Gophers				16									16
Thin w/Chemical				22									22
Weed Control Strip 30%						6							6
Insect Control Codling Moth					92	28		46					166
Fertilize Zinc w/2d CM Spray					1								1
Fertilize CaNO3 w/CM Spray					3	1		1					5
Insect Mite Leafmnr w/1 st CM Spray					77								77
Irrigate 8X				13	13	35	35	32	16				144
Leaf Analysis						3							3
Weed Control Winter Strip												22	22
Pickup Truck Use	9	9	9	9	9	9	9	9	9	9	9	9	110
TOTAL CULTURAL COSTS	493	137	102	121	207	94	56	92	25	9	9	31	1,376
Harvest:													
Harvest									1,476				1,476
Load Bins									161				161
Haul Bins									103				103
Cool, Sort, Pack, Store (Fresh)									6,825				6,825
Handle, Store (Processing)									90				90
TOTAL HARVEST COSTS									8,655				8,655
Interest on operating capital	4	6	6	7	9	10	10	11	87	0	0	0	151
TOTAL OPERATING COSTS/ACRE	498	142	108	128	216	105	67	104	8,767	9	9	30	10,183
TOTAL OPERATING COSTS/TON	17	5	4	4	7	4	2	4	292	0	0	1	339
Cash Overhead:													
Office Expense	4	4	4	4	4	4	4	4	4	4	4	4	50
Liability Insurance	6												6
Sanitation Fees	1	1	1	1	1	1	1	1	1	1	1	1	9
Property Taxes	46						46						91
Property Insurance	13						13						25
Investment Repairs	2	2	2	2	2	2	2	2	2	2	2	2	21
TOTAL CASH OVERHEAD COSTS	71	7	7	7	7	7	65	7	7	7	7	7	202
TOTAL CASH COSTS/ACRE	569	149	115	134	223	111	132	110	8,774	16	15	37	10,385
TOTAL CASH COSTS/TON	19	5	4	4	7	4	4	4	292	1	1	1	346

UC COOPERATIVE EXTENSION

**Table 5. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT and CASH OVERHEAD COSTS
SAN JOAQUIN VALLEY - NORTH 2001**

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
						Insur- ance	Taxes	
01	3 Point Forks	670	15	64	70	2	4	76
01	55HP 2WD Tractor	32,269	12	8,068	3,539	134	202	3,875
01	Bait Applicator	1,046	10	185	133	4	6	144
01	Mower - Rotary 10'	4,494	10	795	573	18	26	617
01	Orch.Sprayer 500 G	19,741	10	3,491	2,516	77	116	2,709
01	Pickup Truck 1/2 T	24,500	7	9,294	3,415	113	169	3,696
01	Shredder - 8' Pull	10,475	15	1,006	1,087	38	57	1,183
01	Truck - 2 Ton	27,380	7	10,386	3,816	126	189	4,131
01	Weed Sprayer 100 G	3,947	10	698	503	15	23	542
TOTAL		124,522		33,987	15,651	528	793	16,972
60% of New Cost *		74,713		20,392	9,391	317	476	10,183

* 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	15,000	20		1,383	50	75	450	1,958
Establishment Costs	88,720	17		8,899	295	444	0	9,638
Fuel Tanks & Pumps	19,835	20	709	1,811	68	103	387	2,369
Hand Tools	4,595	15	460	476	17	25	92	610
Irrigation 75 hp Pump, Filter	15,000	20		1,383	50	75	100	1,608
Irrigation Sprinkler	20,000	15		2,154	67	100	133	2,454
Land	400,000	25	400,000	26,800	0	4,000	0	30,800
Shop Tools	3,500	15	350	363	13	19	47	442
TOTAL INVESTMENT	566,650		401,519	43,264	560	4,840	1,209	49,880

ANNUAL CASH OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	80	acre	6.36	509
Office Expense	75	acre	50.00	3,750
Sanitation Fees	75	acre	8.64	648

UC COOPERATIVE EXTENSION
Table 6. HOURLY EQUIPMENT COSTS
 SAN JOAQUIN VALLEY - NORTH 2001

Yr	Description	COSTS PER HOUR							Total Costs/Hr.	
		Actual Hours Used	Capital Recovery	Cash Overhead			Operating			Total Oper.
				Insur- ance	Taxes	Repairs	Fuel & Lube			
01	3 Point Forks	202.70	0.21	0.01	0.01	0.10	0.00	0.10	0.32	
01	55HP 2WD Tractor	1,204.50	1.76	0.07	0.10	1.42	3.91	5.33	7.26	
01	Bait Applicator	120.00	0.67	0.02	0.03	0.40	0.00	0.40	1.12	
01	Mower - Rotary 10'	196.40	1.75	0.05	0.08	2.12	0.00	2.12	4.00	
01	Orch.Sprayer 500 G	148.70	10.15	0.31	0.47	3.32	0.00	3.32	14.25	
01	Pickup Truck 1/2 T	264.70	7.74	0.26	0.38	1.79	4.34	6.13	14.51	
01	Shredder - 8' Pull	22.00	29.66	1.04	1.57	3.49	0.00	3.49	35.75	
01	Truck - 2 Ton	325.00	7.05	0.23	0.35	2.65	3.47	6.12	13.74	
01	Weed Sprayer 100 G	150.90	2.00	0.06	0.09	1.05	0.00	1.05	3.20	

UC COOPERATIVE EXTENSION
Table 7. RANGING ANALYSIS
 SAN JOAQUIN VALLEY - NORTH 2001

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE APPLES

	YIELD (ton/acre)						
	10.00	15.00	20.00	25.00	30.00	35.00	40.00
OPERATING COSTS/ACRE:							
Cultural Cost	1,376	1,376	1,376	1,376	1,376	1,376	1,376
Harvest Cost	2,885	4,328	5,770	7,212	8,655	10,097	11,540
Interest on operating capital	101	114	126	139	151	164	177
TOTAL OPERATING COSTS/ACRE	4,362	5,818	7,272	8,727	10,182	11,637	13,093
TOTAL OPERATING COSTS/TON	436	388	364	349	339	332	327
CASH OVERHEAD COSTS/ACRE							
CASH OVERHEAD COSTS/ACRE	200	201	201	202	202	203	203
TOTAL CASH COSTS/ACRE	4,562	6,019	7,473	8,929	10,384	11,840	13,296
TOTAL CASH COSTS/TON	456	401	374	357	346	338	332
NON-CASH OVERHEAD COSTS/ACRE							
NON-CASH OVERHEAD COSTS/ACRE	1,086	1,094	1,102	1,109	1,115	1,121	1,126
TOTAL COSTS/ACRE	5,648	7,113	8,575	10,038	11,499	12,961	14,422
TOTAL COSTS/TON	565	474	429	402	383	370	361

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR APPLES

*PRICE (\$/ton)	YIELD (ton/acre)						
	10.00	15.00	20.00	25.00	30.00	35.00	40.00
270.00	-1,662	-1,768	-1,872	-1,977	-2,082	-2,187	-2,293
330.00	-1,062	-868	-672	-477	-282	-87	107
390.00	-462	32	528	1,023	1,518	2,013	2,507
450.00	138	932	1,728	2,523	3,318	4,113	4,907
510.00	738	1,832	2,928	4,023	5,118	6,213	7,307
570.00	1,338	2,732	4,128	5,523	6,918	8,313	9,707
630.00	1,938	3,632	5,328	7,023	8,718	10,413	12,107

NET RETURNS PER ACRE ABOVE CASH COSTS FOR APPLES

*PRICE (\$/ton)	YIELD (ton/acre)						
	10.00	15.00	20.00	25.00	30.00	35.00	40.00
270.00	-1,862	-1,969	-2,073	-2,179	-2,284	-2,390	-2,496
330.00	-1,262	-1,069	-873	-679	-484	-290	-96
390.00	-662	-169	327	821	1,316	1,810	2,304
450.00	-62	731	1,527	2,321	3,116	3,910	4,704
510.00	538	1,631	2,727	3,821	4,916	6,010	7,104
570.00	1,138	2,531	3,927	5,321	6,716	8,110	9,504
630.00	1,738	3,431	5,127	6,821	8,516	10,210	11,904

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR APPLES

*PRICE (\$/ton)	YIELD (ton/acre)						
	10.00	15.00	20.00	25.00	30.00	35.00	40.00
270.00	-2,948	-3,063	-3,175	-3,288	-3,399	-3,511	-3,622
330.00	-2,348	-2,163	-1,975	-1,788	-1,599	-1,411	-1,222
390.00	-1,748	-1,263	-775	-288	201	689	1,178
450.00	-1,148	-363	425	1,212	2,001	2,789	3,578
510.00	-548	537	1,625	2,712	3,801	4,889	5,978
570.00	52	1,437	2,825	4,212	5,601	6,989	8,378
630.00	652	2,337	4,025	5,712	7,401	9,089	10,778

* Overall price is weighted based on total yield @ 70% fresh. 20% neelers. 10% juicers