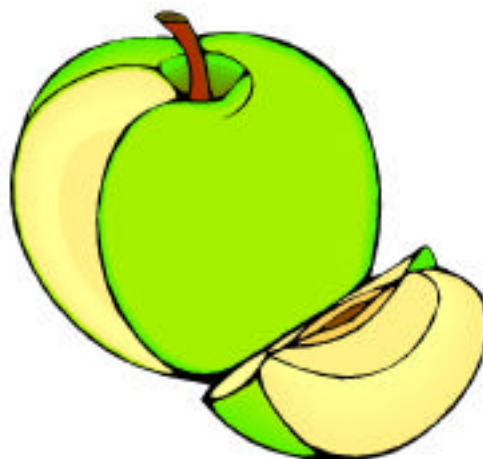

2000

UNIVERSITY OF CALIFORNIA - COOPERATIVE EXTENSION

SAMPLE COSTS TO PRODUCE
APPLES



SIERRA NEVADA FOOTHILLS

Five acre orchard

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UNIVERSITY OF CALIFORNIA - COOPERATIVE EXTENSION

SAMPLE COST TO PRODUCE APPLES

Sierra Nevada Foothills - 2000

INTRODUCTION

The sample costs to produce apples in the Sierra Nevada foothills are presented in this study. The hypothetical farm in this report consists of a total of 20 acres, five acres of apples and fifteen acres of forest, farmstead, roads, and/or other fruit crops.

This study is intended as a guide only, and can be used in making production decisions, determining potential returns, preparing budgets and evaluating production loans. The practices described in this cost study are considered typical for this crop and area. Sample costs given for labor, materials, equipment and contract services are based on current figures. Some costs and practices detailed in this study may not be applicable to your situation. The use of trade names is not an endorsement or a recommendation. A blank “Your Cost” column is also provided to enter your actual costs on Tables 1 and 2.

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For an explanation of calculations used in the study refer to the Assumptions, call the Department of Agricultural and Resource Economics, Cooperative Extension, University of California, Davis, California, (530) 752-3589 or call the Amador or El Dorado County farm advisors.

Sample Cost of Production studies are available for many commodities and can be ordered from the Department of Agricultural and Resource Economics, UC Davis, (530) 752-1515. Current studies, those prepared during the last five years, can be downloaded from their website (www.agecon.ucdavis.edu) or obtained from selected county Cooperative Extension offices.

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ASSUMPTIONS

The following assumptions pertain to sample costs to produce apples in the Sierra Nevada foothills. Practices described should not be considered recommendations by the University of California, but rather represent production procedures considered typical for this crop and area. Some of the costs and practices may not be applicable to your situation nor used during every production year. Additional ones not indicated may be needed. Cultural practices for the production of apples vary by grower and region. Variations can be significant. The practices and inputs used in this cost study serve only as a sample or guide. The costs are presented 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.**

Land. The orchard is owned, managed, and operated by the grower. The orchard is located in the Sierra Nevada foothills and is situated on previously unfarmed land. The farm is comprised of 20 acres, five planted to apples. The other 15 acres are occupied by forest, roads, irrigation systems, farmstead and/or other tree crops. Land is valued at \$10,000 per acre. This study assumes that the land was purchased primarily for a homesite and the orchard was planted on the unused acres.

Trees. Varieties in the area are harvested from late August to early November. No specific variety was chosen in this study, except for a September harvest date. Varieties grown in the area according to harvest sequence are Galas, Golden Delicious, Red Delicious, Red Rome, Granny Smith, and Fuji. Apple trees are planted on a 10' x 16' spacing with 272 trees per acre. In the second year 5% or 15 trees per acre are replanted for those lost in the first year. The life of the orchard in this study is assumed to be 25 years.

Irrigation System. The water is purchased from the local irrigation district. The delivered cost of the water from the district is \$42.00 per acre foot or \$3.50 per acre inch. No assumption is made about effective rainfall. It is assumed in this study, that producing orchards will use 3 acre feet per year. A 5 horsepower booster pump, filtration station and sprinkler irrigation system was installed prior to planting. The irrigation system is considered an improvement to the property and has a 25 year lifespan. It is shown in the non-cash overhead sections as capital recovery cost in the tables and the investments portion of Table 4.

Production Cultural Practices

Pruning. There are two basic pruning strategies for apple trees; central and multiple leader systems. Choice of pruning is dependent on several factors such as the use of size controlling or normal rootstock, varieties susceptible to sunburn, or high density plantings. In this study, pruning is done in the winter months by hand. Prunings are placed into the row middles and pushed out of the orchard by a tractor equipped with a front loader and brush rake, and burned.

Fertilization. Tree nitrogen status is determined by leaf analysis; sampling for analysis is important for proper applications of nitrogen. Over fertilization of trees can cause excessive shoot growth and undesirable characteristics for fresh market apples. Lo-biuret Urea at 20 pounds of N per acre is applied as a foliar application in the spring. Zinc Sulfate 36% at 8 to 10 pounds per acre, and other minor nutrients may be applied at this time, also. In this study zinc sulfate is applied. In the fall, prilled urea at 40 pounds per acre or 18.4 pounds of N per acre is dissolved in water and applied as a foliar spray. In addition to supplying nitrogen, the leaves are burned causing them to fall, decompose rapidly, and in turn reduce scab spores.

Pest Management. Pesticides, rates, and cultural practices mentioned in this cost study are a few of those listed in the *UC IPM Pest Management Guidelines, Apples*. For additional information on pest management, identification, and monitoring, 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 and pesticide use permits, contact the local county Agricultural Commissioner's office.

Weeds. Pre-emergent weeds are controlled in the tree row during the fall by a strip spray of a residual and contact herbicide (Princep- and Roundup-). A tractor and mower are used to mow the tree middles four times from April through July. Weeds that are not controlled by the fall residual spray or cultivation receive spot sprays with a contact herbicide (Roundup-).

Insect and Arthropods. Codling moth is the most economically significant insect pest of apples causing damage that makes the fruit unmarketable. Multiple generations occur annually and are controlled with timed insecticide treatments based on monitoring of the population. The first generation usually begin hatching in May and, in this study, is controlled with Guthion- . The second and third flights normally occur in June and July. Treatments for codling moths also help to control other lepidopteran pests

Diseases. Powdery mildew (*Podosphaera leucotricha*) stunts and distorts affected leaves and shoots, russets fruit, and can reduce production. Control is with a fungicide of Benlate at pink bud and petal fall. Treatment is usually combined with the apple scab sprays. Also, one fire blight spray is incorporated with the above applications.

Apple scab is caused by a fungus which first attacks young leaves as they are growing. Lesions will appear on lower leaf surfaces and inhibit normal leaf growth. If the fungus infects flowers during bloom, the blossoms usually drop causing yield reductions and scabbing of young fruit. Management begins with winter sanitation by destruction/decomposition of leaves and other residue that provide an overwintering site for fungal spores. Pesticide applications are used to combat this disease. In this study, three fungicide treatments are made before infections occur in the spring. Temperature and moisture monitoring are used to pinpoint timing for application of these chemicals. The first treatment is applied at green tip during March. The last two are made in April.

Thinning. Thinning fruit is the same as in the establishment years; a combination of hand fruit removal and chemical agents. In this study, an application of Sevin and NAA occurs in May and selective hand thinning is done in June.

Harvest. Harvest starts in the fourth or fifth year after the orchard is planted depending on variety and other factors. In the first few years the orchard is harvested with a single picking. After that, size picking for apples commences and trees are picked twice. The first pick usually collects 50% of the fruit. The second pick gathers the remaining apples about a week or two later. Labor required for harvesting the second pick is less than the first pick since fruit is not selectively chosen. Harvest crews use ladders and picking bags to hand pick fruit that is placed into field bins. Tractors with forklift attachments on both the front loader and 3 point hitch pick up the filled bins, move them from the orchard, and place the bins on a flatbed truck or bin trailer which transports them to a packing shed for cleaning, sorting, and packing. In this cost study, the crop is harvested and hauled by the grower. For growers that contract their harvest, the equipment and labor used for harvest operations should be subtracted from Harvest Costs in Tables 1, 2, and 3, and custom harvest charges should be added to Harvest Costs in the same tables.

Yields. Yields fall into three categories; fresh market, peelers, and juicers. The latter two categories are apples that will not make fresh market grades for appearance, size, or other damage factors, but can be used for processing into juice, sauce or other processed apple products. Apples that go to processing receive lower prices than fresh market fruit. An assumed yield of 12 net tons per acre is used to calculate cost and returns per ton. Yields for the three different categories in this study are as follows: fresh market - 60%, processed 40% (peelers - 30%, and juicers - 10%). Yield maturity is reached in the eighth year.

Returns. Growers are paid for fruit based on gross field tons for different grades. Estimated return prices per ton are fresh market - \$800, processed (peelers and juicers) - \$110. Return prices for apples are used to calculate ranging analysis for different yields and price. The yields and prices used in this cost study are an estimate based on current market conditions.

Packing. Cleaning, sorting, and packing costs are paid by the grower. The majority of the production in the Sierra Nevada Foothills is for fresh market sales. The apples are delivered to the growers own packing shed or a local packer, depending on the operation size. Growers will either process their own apples or sell them to a processor. A large portion of growers belong to the Apple Hill Growers Association which promotes the agricultural sales of the growers products in the area. A grower may have his own label and products - fresh apples, processed (baked pies and apple juice) and other agricultural products. The majority of the products are sold at a roadside stand, and on some farms a single employee will sort, pack and sell.

Labor. Hourly wages for workers are \$8.23 and \$6.00 per hour for machine and non-machine workers, respectively. Adding 34% for the employers share of federal and state payroll taxes, insurance, and other possible benefits gives the labor rates shown of \$11.02 and \$8.04 per hour for machine labor and non-machine labor, respectively. Labor time 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. Wages for a manager are not included as a cost. Returns above total costs is considered a return to management and risk.

Risk. Risk is caused by various sources of uncertainty including production, price, and financial. Examples are yield reductions, price decreases, and fluctuations in interest rates. The risks associated with producing apples in the Sierra Nevada foothills should not be underestimated.

While this study makes every effort to model a production system based on typical, real world practices, it cannot fully represent agronomic, market, and financial risks which affect the profitability and economic viability of apple production. Additionally, establishment of orchards and the equipment required to properly handle the fruit is capital intensive. Growers should consider all of the agronomic and economic risks before committing resources to establishing an orchard in this region.

Overhead Costs

Cash Overhead. Cash overhead consists of various cash expenses paid out during the year that are assigned to the whole farm, not to a particular operation. These costs include property taxes, interest on operating capital, office expense, liability and property insurance, and equipment 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 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 10.41% per year. A nominal interest rate is the typical market cost of borrowed funds.

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 0.723% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$367 for the entire farm.

Office Expense. Office and business expenses for the five acres are estimated at \$1,500 annually or \$300 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, road maintenance, etc.

Non-cash Overhead. Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments. Although farm equipment used on farms in the Sierra Nevada foothills may be purchased new or used, this study shows the current purchase price for new equipment. The new purchase price is adjusted to 40% to indicate a mix of new and used equipment. Annual ownership costs (Equipment and Investments) are shown in Tables 1-3. 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 price and salvage value (unrecovered capital). Put another way, 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. The calculation for the annual capital recovery costs is as follows.

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

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery (e.g., 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 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. It is the function of the interest rate and years of life of the equipment.

Interest Rate. The interest rate of 7.08% 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.

Establishment Costs. The cost to establish the orchard is used to determine the non-cash overhead expenses: capital recovery on investment for the production years. The establishment costs is the sum of cash costs for land preparation, planting, trees, production expenses, and cash overhead for growing apple trees through the first year fruit is harvested minus any returns from production. The total accumulated net cash cost in the fifth year represents the establishment cost per acre. In this the study, the cost is estimated from establishment budgets supplied by the farm advisor. The estimated cost is \$9,500 per acre or \$47,500 for the five acre orchard. To calculate the annual capital recovery cost, the establishment cost is amortized beginning in the sixth year over the remaining 20 years of orchard production.

Equipment Cash Costs. 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 fuel, lubrication, and repairs.

In allocating the equipment costs on a per acre basis, the hourly charges are calculated first and shown in Table 5. 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 hp, and type of fuel used. The fuel 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 cultural practice by the number of hours per acre for that operation. Tractor time is 10% higher than implement time for a given operation to account for setup time. Prices for on-farm delivery of diesel and gasoline are \$1.09 and \$1.49 per gallon, respectively.

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

Acknowledgment

Appreciation is expressed to Dave Bolster of Barsotti Juice Co, growers and other cooperators who provided support.

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Table 1.

UC COOPERATIVE EXTENSION
COST PER ACRE TO PRODUCE APPLES
SIERRA NEVADA FOOTHILLS - 2000
5 Acres

Operation	Cash and Labor Costs per Acre						Total Cost	Your Cost
	Operation Time (Hrs/A)	Labor Cost	Fuel,Lube & Repairs	Material Cost	Custom/Rent			
Cultural:								
Prune	75.00	603	0	0	0		603	
Brush Removal - Burn	0.75	58	4	0	0		62	
Pest Control - Dormant	0.41	5	3	13	0		22	
Pest Control - Greentip PM/AS	0.41	5	3	16	0		25	
Leaf Analysis	0.00	0	0	0	4		4	
Fertilize - Nitrogen	0.82	11	6	17	0		34	
Weed Control - Spot Spray	0.10	1	1	4	0		5	
Pest Control - Pinkbud PM/AS	0.41	5	3	11	0		20	
Pest Control - PM/AS/FB	0.41	5	3	6	0		15	
Pest Control - Codling Moth 4X	1.02	13	8	88	0		109	
Thin Fruit - Hand	60.00	482	0	0	0		482	
Thin Fruit - Chemical	0.33	4	2	184	0		190	
Irrigate	1.14	9	0	126	0		135	
Weed Control Berms	0.18	2	1	17	0		21	
Mow Middles	1.16	15	8	0	0		23	
Weed Control - Winter Strip	0.26	3	1	4	0		8	
Pickup Truck Use	6.33	84	33	0	0		116	
TOTAL CULTURAL COSTS	148.72	1,309	76	486	4		1,872	
Harvest:								
1st Pick	28.00	225	0	0	0		225	
Haul To Shed	20.46	271	137	0	0		408	
2nd Pick	24.69	199	0	0	0		199	
Pack Fruit	0.00	0	0	0	2,498		2,498	
Sell Fresh Fruit	0.00	0	0	0	216		216	
TOTAL HARVEST COSTS	73.15	694	137	0	2,714		3,545	
Interest on operating capital @ 10.71%							130	
TOTAL OPERATING COSTS/ACRE		2,003	214	486	2,718		5,550	
TOTAL OPERATING COSTS/TON							771	
CASH OVERHEAD:								
Office Expense							25	
Liability Insurance							18	
Sanitation Fees							4	
Property Taxes							187	
Property Insurance							135	
Investment Repairs							201	
TOTAL CASH OVERHEAD COSTS							571	
TOTAL CASH COSTS/ACRE							6,121	
TOTAL CASH COSTS/TON							851	

UC COOPERATIVE EXTENSION

Table 1. Continued

NON-CASH OVERHEAD:			
	Per producing Acre	Annual Cost Capital Recovery	
Investment			
Buildings	2,235	212	212
Fuel Tanks & Pumps	354	33	33
Shop Tools	632	67	67
Land	10,000	708	708
Sprinkler System	2,588	224	224
Ladders - 10 each	70	10	10
Picking Bags	15	4	4
Pruning Equipment	66	9	9
Hand Tools	230	24	24
Apple Establishment	9,500	902	902
Equipment	1,349	163	163
TOTAL NON-CASH OVERHEAD COSTS	27,039	2,355	2,355
TOTAL COSTS/ACRE			8,475
TOTAL COSTS/TON			1,177

Table 2.

UC COOPERATIVE EXTENSION
 COSTS AND RETURNS PER ACRE TO PRODUCE APPLES
 SIERRA NEVADA FOOTHILLS - 2000
 5 acre planting

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Fresh	7.20	ton	800.00	5,760	
Processed	4.80	ton	110.00	528	
TOTAL GROSS RETURNS	12.00	ton		6,288	
OPERATING COSTS					
Acaricide:					
Dormant Oil	2.00	gal	3.75	8	
Insecticide:					
Diazinon 50 W	1.00	lb	5.65	6	
Guthion 50W	4.50	lb	12.00	54	
Imidan 70WSP	4.25	lb	7.95	34	
Fungicide:					
Benlate SP	0.25	lb	20.20	5	
Dithane DF	3.20	lb	3.50	11	
Rally	3.17	oz	4.45	14	
Contract:					
Leaf Analysis	1.00	acre	4.00	4	
Fertilizer:					
Zinc Sulfate 36%	5.00	lb	0.38	2	
46-0-0 Lo Biuret Urea	20.00	lb N	0.53	11	
46-0-0 (Urea) Prilled	18.40	lb N	0.24	4	
Herbicide:					
Roundup Ultra	3.16	pint	6.18	20	
Princep Caliber 90	1.02	lb	4.75	5	
Antibiotic:					
Agri-mycin 17	2.40	oz	1.44	3	
Growth Regulator:					
NAA	1.00	gal	157.06	157	
Sevin 80S	5.00	lb	5.31	27	
Irrigation:					
Water - District	36.00	acin	3.50	126	
Custom:					
Pack Box	337.50	box	7.40	2,498	
Sell Commission 4%	337.50	box	0.64	216	
Labor (machine)	39.65	hrs	11.02	437	
Labor (non-machine)	194.83	hrs	8.04	1,566	
Fuel - Gas	15.81	gal	1.49	24	
Fuel - Diesel	89.50	gal	1.09	98	
Lube				18	
Machinery repair				74	
Interest on operating capital @ 10.71%				130	
TOTAL OPERATING COSTS/ACRE				5,550	
TOTAL OPERATING COSTS/TON				771	
NET RETURNS ABOVE OPERATING COSTS				738	

UC COOPERATIVE EXTENSION

Table 2. continued

CASH OVERHEAD COSTS:	
Office Expense	25
Liability Insurance	18
Sanitation Fees	4
Property Taxes	187
Property Insurance	135
Investment Repairs	201
TOTAL CASH OVERHEAD COSTS/ACRE	571
TOTAL CASH COSTS/TON	850
NON-CASH OVERHEAD COSTS (CAPITAL RECOVERY)	
Buildings	212
Fuel Tanks & Pumps	33
Shop Tools	67
Land	708
Sprinkler System	224
Ladders - 10 each	10
Picking Bags	4
Pruning Equipment	9
Hand Tools	24
Apple Establishment	902
Equipment	163
TOTAL NON-CASH OVERHEAD COSTS/ACRE	2,355
TOTAL COSTS/ACRE	8,476
TOTAL COSTS/TON	1,177
NET RETURNS ABOVE TOTAL COSTS	-2,188

Table 3.

UC COOPERATIVE EXTENSION
MONTHLY CASH COST TO PRODUCE APPLES
SIERRA NEVADA FOOTHILLS - 2000
5 Acre Planting

Beginning JAN 00	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Ending DEC 00	00	00	00	00	00	00	00	00	00	00	00	00	00
Cultural:													
Prune	603												603
Brush Removal - Burn	62												62
Pest Control - Dormant		22											22
Pest Control - Greentip			25										25
Leaf Analysis				4									4
Fertilize - Nitrogen					21					13			34
Weed Control - Spot Spray				5									5
Pest Control - Pinkbud PM				20									20
Pest Control - PM/AS/FB				15									15
Pest Control - Codling Moth 4X					23	23	62						109
Thin Fruit - Hand						482							482
Thin Fruit - Chemical					190								190
Irrigate					16	30	44	46					135
Weed Control Berms				21									21
Mow Middles					6	6	6	6					23
Weed Control - Winter Strip Spray											8		8
Pickup Truck Use	10	10	10	10	10	10	10	10	10	10	10	10	116
TOTAL CULTURAL COSTS	675	31	34	74	266	551	121	62	10	23	18	10	1,875
Harvest:													
1st Pick									225				225
Haul To Shed									408				408
2nd Pick									199				199
Pack Fruit									2,498				2,498
Sell Fresh Fruit									216				216
TOTAL HARVEST COSTS									3,545				3,545
Interest on oper. capital	6	6	7	7	10	15	16	16	48	0	0	0	130
TOTAL OPERATING COSTS/ACRE	681	38	41	82	279	572	146	87	3,603	22	18	9	5,550
TOTAL OPERATING COSTS/TON	95	5	6	11	39	79	20	12	500	3	2	1	771
OVERHEAD:													
Office Expense	2	2	2	2	2	2	2	2	2	2	2	2	25
Liability Insurance	18												18
Sanitation Fees	0	0	0	0	0	0	0	0	0	0	0		4
Property Taxes	94						94						187
Property Insurance	135												135
Investment Repairs	17	17	17	17	17	17	17	17	17	17	17	17	201
TOTAL CASH OVERHEAD COSTS	266	19	19	19	19	19	113	19	19	19	19	19	571
TOTAL CASH COSTS/ACRE	948	57	60	101	298	591	259	107	3,622	42	37	28	6,120
TOTAL CASH COSTS/TON	132	8	8	14	41	82	36	15	503	6	5	4	850

Table 4.

UC COOPERATIVE EXTENSION
WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT and BUSINESS OVERHEAD COSTS
SIERRA NEVADA FOOTHILLS - 2000

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
						Insur- ance	Taxes	
00	3 Point Forks	670	15	64	71	3	4	78
00	62 HP 2WD Tractor	28,850	15	5,617	2,961	125	172	3,258
00	Bin Trailers W/Bin	10,500	7	2,679	1,645	48	66	1,758
00	Brush Rake - 10'	2,245	25	64	193	8	12	213
00	Front End Loader	4,852	15	466	517	19	27	563
00	Loader Forks	730	15	70	78	3	4	85
00	Mower/Chopper - 8'	6,713	10	1,187	874	29	40	942
00	Orch.Sprayer 500 G	19,741	4	7,266	4,204	98	135	4,437
00	Pickup Truck 1/2 T	18,200	7	6,904	2,591	91	126	2,807
00	Weed Sprayer 100 G	3,947	10	698	514	17	23	554
TOTAL		96,448		25,015	13,648	439	607	14,694
40% of New Costs*		38,579		10,006	5,459	176	243	5,878

* 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	
INVESTMENT								
Apple Establishment (est.)	47,500	20		4,512	172	238	0	4,921
Buildings	44,693	20		4,245	162	223	894	5,524
Fuel Tanks & Pumps	7,088	20	709	656	28	39	142	865
Hand Tools	4,595	15	460	489	18	25	92	624
Ladders - 10 each	1,400	10	140	190	6	8	28	231
Land	50,000	25	50,000	3,540	362	500	0	4,402
Picking Bags	296	5		72	1	1	0	75
Pruning Equipment	1,313	10	131	178	5	7	26	217
Shop Tools	12,637	15	1,264	1,345	50	70	253	1,717
Sprinkler System	12,940	25		1,118	47	65	647	1,877
TOTAL INVESTMENT	182,462		52,704	16,345	850	1,176	2,082	20,453

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/		Price/ Unit	Total Cost
	Farm	Unit		
Liability Insurance	20	acre	18.35	367
Office Expense	20	acre	25.00	500
Sanitation Fees	20	acre	3.90	78

Table 5.

UC COOPERATIVE EXTENSION
HOURLY EQUIPMENT COSTS
SIERRA NEVADA FOOTHILLS - 2000

		COSTS PER HOUR							
Yr	Description	Actual Hours Used	Cash Overhead			Operating		Total Oper.	Total Costs/Hr.
			Capital Recovery	Insur- ance	Taxes	Repairs	Fuel & Lube		
00	3 Point Forks	146.30	0.20	0.01	0.01	0.06	0.00	0.06	0.28
00	62 HP 2WD Tractor	809.90	1.46	0.06	0.09	0.81	3.82	4.63	6.24
00	Bin Trailers W/Bin	382.30	1.72	0.05	0.07	1.04	0.00	1.04	2.88
00	Brush Rake - 10'	3.80	20.59	0.89	1.23	0.20	0.00	0.20	22.91
00	Front End Loader	170.10	1.22	0.05	0.06	0.45	0.00	0.45	1.78
00	Loader Forks	166.30	0.19	0.01	0.01	0.07	0.00	0.07	0.27
00	Mower/Chopper - 8'	202.80	1.72	0.06	0.08	1.83	0.00	1.83	3.69
00	Orch.Sprayer 500 G	499.10	3.37	0.08	0.11	2.32	0.00	2.32	5.88
00	Pickup Truck 1/2 T	285.70	3.63	0.13	0.18	0.88	4.28	5.16	9.09
00	Weed Sprayer 100 G	150.70	1.36	0.04	0.06	0.70	0.00	0.70	2.17

Table 6.

UC COOPERATIVE EXTENSION
RANGING ANALYSIS
SIERRA NEVADA FOOTHILLS - 2000

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE APPLES

	YIELD Fresh Market (TON/ACRE)						
	5.04	5.76	6.48	7.20	7.92	8.64	9.36
OPERATING COSTS/ACRE:							
Cultural Cost	1,875	1,875	1,875	1,875	1,875	1,875	1,875
Harvest Cost	2,469	2,828	3,186	3,545	3,904	4,262	4,621
Interest on operating capital	121	124	127	130	133	137	140
TOTAL OPERATING COSTS/ACRE	4,464	4,826	5,188	5,550	5,912	6,274	6,636
TOTAL OPERATING COSTS/TON	886	838	801	771	746	726	709
CASH OVERHEAD COSTS/ACRE							
CASH OVERHEAD COSTS/ACRE	569	570	570	571	571	572	572
TOTAL CASH COSTS/ACRE	5,033	5,396	5,758	6,121	6,483	6,845	7,208
TOTAL CASH COSTS/TON	999	937	889	850	819	792	770
NON-CASH OVERHEAD COSTS/ACRE							
NON-CASH OVERHEAD COSTS/ACRE	2,335	2,342	2,349	2,355	2,361	2,367	2,373
TOTAL COSTS/ACRE	7,368	7,738	8,107	8,476	8,844	9,213	9,581
TOTAL COSTS/TON	1,462	1,343	1,251	1,177	1,117	1,066	1,024

UC COOPERATIVE EXTENSION

Table 6 continued

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR APPLES

PRICE (DOLLARS/TON)		YIELD (TON/ACRE)						
Fresh		5.04	5.76	6.48	7.20	7.92	8.64	9.36
	Processed	3.36	3.84	4.32	4.80	5.28	5.76	6.24
560	77	-1,383	-1,305	-1,226	-1,148	-1,070	-992	-913
640	88	-943	-802	-661	-519	-378	-237	-96
720	99	-503	-299	-95	109	313	517	721
800	110	-62	204	471	738	1,005	1,272	1,539
880	121	378	707	1,037	1,367	1,697	2,027	2,356
960	132	818	1,211	1,603	1,996	2,388	2,781	3,174
1,040	143	1,258	1,714	2,169	2,625	3,080	3,536	3,991

NET RETURNS PER ACRE ABOVE CASH COSTS FOR APPLES

PRICE (DOLLARS/TON)		YIELD (TON/ACRE)						
Fresh		5.04	5.76	6.48	7.20	7.92	8.64	9.36
	Processed	3.36	3.84	4.32	4.80	5.28	5.76	6.24
560	77	-1,952	-1,874	-1,797	-1,719	-1,641	-1,564	-1,486
640	88	-1,512	-1,371	-1,231	-1,090	-950	-809	-668
720	99	-1,072	-868	-665	-461	-258	-54	149
800	110	-632	-365	-99	167	434	700	967
880	121	-191	138	467	796	1,125	1,455	1,784
960	132	249	641	1,033	1,425	1,817	2,209	2,601
1,040	143	689	1,144	1,599	2,054	2,509	2,964	3,419

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR APPLES

PRICE (DOLLARS/TON)		YIELD (TON/ACRE)						
Fresh		5.04	5.76	6.48	7.20	7.92	8.64	9.36
	Processed	3.36	3.84	4.32	4.80	5.28	5.76	6.24
560	77	-4,287	-4,216	-4,146	-4,074	-4,003	-3,931	-3,859
640	88	-3,846	-3,713	-3,580	-3,446	-3,311	-3,176	-3,041
720	99	-3,406	-3,210	-3,014	-2,817	-2,619	-2,422	-2,224
800	110	-2,966	-2,707	-2,448	-2,188	-1,928	-1,667	-1,406
880	121	-2,526	-2,204	-1,882	-1,559	-1,236	-913	-589
960	132	-2,086	-1,701	-1,316	-930	-244	-158	229
1,040	143	-1,646	-1,198	-750	-302	147	597	1,046