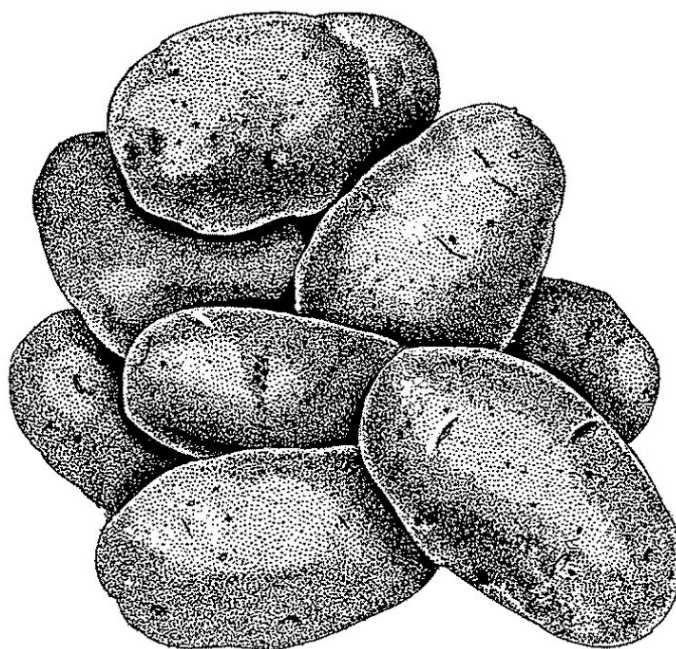

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2008

SAMPLE COSTS TO PRODUCE

POTATOES



Fresh Market

KLAMATH BASIN in the INTERMOUNTAIN REGION

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INTRODUCTION

The sample costs to produce fresh market potatoes in the Tulelake Basin of the Intermountain Region are presented in this study. The 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 are based on production procedures 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 1 and 2 is provided for you to enter your costs.

The hypothetical farm operation, production practices, overhead, and calculations are described under the assumptions. For additional information or explanation of calculations used in the study call the Department of Agricultural and Resource Economics, University of California, Davis, California, 530-752-2414 or the Intermountain Research and Extension Center, 530-667-5117.

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Sample Cost of Production studies for many commodities are available and can be requested through the Department of Agricultural and Resource Economics, UC Davis, 530-752-1517. Current and some archived studies can be obtained from selected county UC Cooperative Extension offices or downloaded from the department website <http://coststudies.ucdavis.edu>.

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ASSUMPTIONS

The following assumptions pertain to sample costs to produce potatoes for the fresh market in the Klamath Basin of the Intermountain Region. Practices described should not be considered recommendations by the University of California, but represent production procedures considered typical for this crop and area. Some of the costs and practices may not be applicable to your situation or used during every production year. Other practices not indicated may be needed. Cultural practices and costs to produce potatoes will vary by grower and region, and can be significant. The practices and inputs used in this cost study serve as a sample or guide, only. 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.**

Farm. This report is based on a hypothetical 1,500 acre farm. Potatoes are grown on 250 acres of which the grower owns 30% of the potato acreage and rents the other 70%. The whole 1,500 acre farm has 50 acres (10 owned acres and 40 rented acres) are roads, irrigation systems, farmstead, and unused or unusable land. Typically, a grower with this amount of potato acreage will have several non-adjacent fields and the cultural practices will probably vary among fields. Additionally, extra costs may be involved for moving equipment between fields, but are not included in this study. Other crops that might be grown in rotation with the potatoes include onions, small grains, alfalfa, and horseradish. In this report, practices completed on less than 100% of the acres are denoted as a percentage of the total potato crop acreage.

Owned potato land normally ranges from \$3,000 to \$4,000 per acre. This study uses a value of \$3,500 per acre or \$3,646 per producing acre. In this study only 30% of the land is owned by the grower.

Rented land in this region range between \$180 to \$350 per are with surface water attached to the land, but the water is not paid for by the landowner. The cost of the water is borne by the grower renting the land. A rental price of \$300 per acre is used in this study or \$313 per producing acre.

CULTURAL PRACTICES AND MATERIAL INPUTS

Land Preparation. It is assumed that the ground planted to the potato crop is coming out rotation of another crop. It is also assumed that 80% of the acreage will need the proceeding crop residue chopped to start ground preparations in the fall before planting. A heavy disc is then used to start incorporating residue into the soil and performs the operation 1.5 times on the fields. Only 25% of the ground is ripped, but that ground is ripped 1.5 times. The fields are set with a solid set of sprinklers. When the ground is dry enough 25% of the acres are rotospiked and a pesticide, Vapam, is injected into the soil. The last fall operation is made in October with gypsum spread on 25% of the fields by a custom operator.

Beginning in April a quarter of the potato ground is chiseled followed by Rotospiking the remaining 75% of the land that had not been done in the fall. During the rotospike operation Vapam is applied also, but on only 65% of the same acres.

Irrigation. Irrigation begins in September with of 2.0 acre-inches of water sprinkled on 30% of the acres of the potato fields. Growers will place a portable pump with a diesel engine and fuel tank along a canal. With the pump end situated in the canal a solid set of sprinkler pipes is placed in the furrows and only put up on the beds to plant and cultivate once during the growing season. Potatoes are irrigated for four months after planting. A total of 23.0 acre-inches of water are sprinkled on during the growing season

and usually apply either fertilizers or pesticides during the irrigations. Potatoes are irrigated during June through August. Prior to harvest all of the pipes are removed from the fields.

Fertilization. A mixed preplant fertilizer with other nutrients is custom applied in May. Nitrogen, phosphorus, potassium, zinc, manganese, and copper are put directly into the beds prior to planting. During the growing season calcium nitrate is applied through the sprinklers in June and August.

Planting. Potato seeds are cut, treated with a pesticide, and hauled to the grower by custom service for \$3.25 per hundredweight (cwt). An additional fungicide, such as Quadris is often applied in the seed furrow at planting. Potatoes are planted in 36 inch-beds at a rate of 18 cwt per acre by the grower.

Pest Management. The pesticides and rates mentioned in this cost study are listed in UC *Integrated Pest Management Guidelines, Potato*. For more information on 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.

After planting, all treatments of potatoes using pesticides are made by either chemigation (pesticides and/or fertilizers applied through the irrigation water) or by airplane. Some pesticides and fertilizers are mixed and applied together during the same irrigation. Most pesticides are applied to a portion of the potato acreage.

Weeds. A single cultivation occurs soon after the potatoes are planted in May. Chemigation of herbicides starts in June using Prowl and Outlook on 25% of the acreage and the combination of Sencor and Matrix used on 100 % of the acreage.

Insects and nematodes. Control of insects also begins with a chemigation in June with Vydate applied on 30% of the acreage. The last two insecticide treatments consist of Monitor to control worms and aphids sprayed by aircraft over 90% of the acreage each time. The first application is made in July and the last is made in August.

Diseases. The most problematic pests of potatoes are diseases. Control begins with Ridomil Gold Bravo combined with a June irrigation over 90% of the acres. In July the potatoes are chemigated again with two separate applications of Endura for white mold control and a third treatment of Ridomil Gold Bravo in the irrigation water. The Ridomil Gold Bravo application is used on 90% of the crop. The final disease management sprays are put on by two separate aircraft applications of Dithane and Bravo for early blight control, both applied in August prior to harvest.

Growth Regulator and Desiccant. A growth regulator, Royal MH-30, is used to prevent sprouting in storage and is applied in August by aircraft over 85% of the acreage. Later in September a desiccant is used to dry out the remaining plant tops. Much of the above-ground vegetative matter dries out with crop maturity or killing fall frosts, but Reglone is applied by aircraft on 50% of the acreage to help harvesting by drying out remaining growth.

Harvest. After sprinkler pipe removal the beds and vines are flattened by a roller and vines cut. A windrower is then used to dig and place two rows of potatoes on top of the two nearest un-dug rows. The potatoes are then harvested with a large horsepower tractor pulling a two-row digger and deposited in a 20 foot, 15-22 ton bottom-conveyor belt truck for transport to storage. Because the harvester digs two rows

and picks up the other two rows that the windrower placed on the un-dug rows the two-row digger is actually harvesting four rows with each pass.

Growers may choose to own harvesting equipment, purchased either new or used, or hire a custom harvester. Many factors are important in deciding which harvesting option a grower uses. These considerations and appropriate method of analysis are discussed in *"Acquiring Alfalfa Hay Harvest Equipment: A Financial Analysis of Alternatives"*.

Transportation and Storage. Once the trucks are loaded in the field they are tarped before they are driven to the storage shed. Hauling potatoes from the field to the storage sheds is assumed to be 15 miles roundtrip.

Once at the sheds trucks are unload by the conveyer belt running the length of the truck bed into a large holding tub. These special tubs allow for faster unloading of the trucks and movement into the storage shed. It is assumed in this study that the grower does not own the storage facility, though many do. The current cost of storing the potato in this study \$0.40 per cwt annually. Most potatoes are stored in the sheds for only four months. During storage the potatoes are treated to prevent sprouting and the grower is charged \$0.16 per cwt.

Yields. The crop yield used in this study is 500 cwt per acre. Yields have varied over the years in the Tulelake Basin of the Intermountain Region and are shown in Table A.

Returns. The county averages for the last five years are shown in Table A. The table also includes the average price in the Tulelake Irrigation District during 2002 through 2006. A selling price of \$7.00 per cwt of fresh market potato is used to estimate income.

Table A. Average Tulelake potato yields and price

Potatoes - (Fresh Market)	Acres	Yields	Price
--- Year ---		-- Cwt/Acre --	--- \$/Cwt ---
2002	4,535	550	\$7.30
2003	3,600	450	\$5.57
2004	3,890	520	\$5.18
2005	2,936	475	\$8.67
2006	<u>3,483</u>	<u>500</u>	<u>\$8.16</u>
5 Year Average	3,689	499	\$6.98

Source: Tulelake Irrigation District. 2002-2006.

Assessments. Under a state marketing order a mandatory assessment fee is collected and administered by the California Potato Research Advisory Board (CPRAB). This assessment of \$0.01 per cwt pays for potato research in California.

Risk. Risks associated with potato production are not assigned a production cost. 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 potato production.

Labor. Labor rates of \$19.14 per hour for machine operators and \$12.51 for non-machine workers includes payroll overhead of 39%. The basic hourly wages are \$13.77 for machine operators and \$9.00 for non-machine labor. The overhead includes the employers' share of federal and California state payroll taxes, workers' compensation insurance for field crops (code 0171), and a percentage for other possible benefits. Workers' compensation insurance costs will vary among growers, but for this study the cost is based upon the average industry final rate as of January 1, 2008 (California Department of Insurance). Labor for operations involving machinery are 20% higher than the operation time given in Table 1 and 4 to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and field repair.

Cash Overhead

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, rents, and investment repairs. Cash overhead costs are included in Tables 1, 2, 3 and 4.

Equipment Operating Costs. Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by American Society of Agricultural Engineers (ASAE). Fuel and lubrication costs are also determined by ASAE equations based on maximum power-take-off (PTO) horsepower, and fuel type. Prices for on-farm delivery of diesel and gasoline are \$2.30 and \$2.80 per gallon, respectively. Fuel costs are derived from American Automobile Association (AAA) and Energy Information Administration (EIA) 2008 monthly data. The cost includes a 2% local sales tax on diesel fuel and 8% sales tax on gasoline. Gasoline also includes federal and state excise tax, which are refundable for on-farm use when filing your income tax. The fuel, lube, and repair cost per acre for each operation in Table 1 are determined by multiplying the total hourly operating cost in Table 6 for each piece of equipment used for the selected operation by the hours per acre. Tractor time is 10% higher than implement time for a given operation to account for setup, travel and down time.

Property Taxes. Counties charge a base property tax at the rate of 1% on the assessed value of the property including land, equipment, buildings, and improvements. In some counties special assessment districts exist and charge additional taxes on property. 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. Land value is assumed to remain unchanged.

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 8.75% per year. It is assumed that all cash operations are financed. A nominal interest rate is the typical market cost of borrowed funds. Any postharvest costs of operations are discounted back to the harvest month using a negative interest charge.

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 \$1,305 for the entire farm or \$0.87 per acre.

Office Expense. Office and business expenses are estimated at \$12.00 per acre. These expenses include office supplies, telephones, bookkeeping, accounting and legal fees, road maintenance, and miscellaneous business expenses.

Rent. Cash rents range from \$180 to \$300 per producing acre. The grower in this study rents 175 acres of which 149 are producing or planted acres and the grower pays \$275 per rented producing acre to the landlord. The rent cost is charged to the rented potato land (175 acres) at \$323 per producing acre. The non-producing acres are roads, irrigation system, and equipment yard.

Investment Repairs. Annual cash maintenance or repair costs are associated with investments under non-cash overhead. Repairs to the fuel tanks and pumps, shop building, shop tools, irrigations system, tool carrier, and fuel wagon are calculated at 10% of new cost distributed over the investment life.

Non-Cash Overhead Costs

Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments. This study shows the current purchase price for new equipment and then adjusts the potato to 40% of new cost to indicate a mix of new and used equipment. Annual ownership costs for equipment and investments are shown in Tables 1, 2, and 4 as the capital recovery cost 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 (Boehlje and Eidman). The calculation for the annual capital recovery costs is as follows:

$$\left[\left(\frac{\text{Purchase Price} - \text{Salvage Value}}{\text{Capital Recovery Factor}} \right) \right] + \left[\frac{\text{Salvage Value} \times \text{Interest Rate}}{\text{Value Rate}} \right]$$

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery (tractors and implements) the remaining value is a percentage of the new cost of the investment (Boehlje and Eidman). The percent remaining value is calculated from equations developed by the American Society of Agricultural Engineers (ASAE) based on equipment type and years of life. The life in years is estimated by dividing the wearout life, as given by ASAE by the annual hours of use in this operation. For other investments including irrigation systems, buildings, and miscellaneous equipment, the value at the end of its useful life is zero. The salvage value for land is 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.

Interest Rate. The interest rate of 8.75% is used to calculate capital recovery cost is the effective long term interest rate in January 2008. The interest rate is provided by a local farm lending agency and will vary according to risk and amount of loan.

Equipment. Other equipment is listed as investments and are used on the entire farm. The cost of these investments shows up as non-cash cost in tables 1 and 2. Each investment current purchase price, assumed years of life, and other costs are listed in table 4.

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

Acknowledgements. The authors appreciate the help provided by those growers and other cooperators who provided information for this study.

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UC COOPERATIVE EXTENSION
 COSTS PER ACRE TO PRODUCE POTATO
 KLAMATH BASIN IN THE INTERMOUNTAIN REGION- 2008

Table 1.

Labor Rate: \$19.14/hr. machine labor
 \$12.51/hr. non-machine labor

Interest Rate: 8.75%
 Yield per Acre: 500.0 Cwt

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per Acre				Total Cost	Your Cost
		Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent		
Preplant:							
Land Preparation: Chop Crop Residue on 80% of Acres	0.15	4	6	0	0	10	
Land Preparation: Stubble Disc Field 1.5X	0.22	5	10	0	0	15	
Land Preparation: Rip 1.5X on 25% of Acres	0.10	2	5	0	0	7	
Land Preparation: Pre-irrigate	0.15	2	0	53	0	55	
Land Preparation: Rotospike & Vapam 25% of Acre	0.05	1	3	0	0	4	
Land Preparation: Apply Gypsum on 25% of Acres	0.00	0	0	12	2	13	
Land Preparation: Chisel 25% of Acres	0.03	1	1	0	0	2	
Land Preparation: Rotospike & Vapam (65%) 75% of Acres	0.16	4	8	0	0	12	
Fertilize Beds	<u>0.00</u>	<u>0</u>	<u>0</u>	<u>416</u>	<u>25</u>	<u>441</u>	
TOTAL PREPLANT COSTS	0.86	18	33	481	27	559	
Cultural:							
Plant Potatoes	0.25	6	15	57	3	81	
Weed Control - Cultivate	0.14	3	5	0	0	8	
Irrigate & Fertilize	2.60	33	0	68	0	100	
Weed Control - Outlook & Prowl on 25% of Acres	0.50	6	0	21	0	27	
Insect Control - Sencor & Matrix	0.50	6	0	39	0	45	
Disease Control - Ridomil Gold Bravo on 90% of Acres	0.50	6	0	47	0	54	
Irrigate	3.58	45	0	55	0	109	
Insect Control - Monitor 2X - on 90% of Acres	0.00	0	0	63	15	79	
Disease Control - Endura 2X	1.16	15	0	76	0	90	
Disease Control - Ridomil Gold Bravo on 90% of Acres	0.58	7	0	49	0	56	
Disease Control - Dithane	0.00	0	0	6	9	15	
Disease Control - Bravo	0.00	0	0	8	9	16	
Growth Regulator - Royal on 85% of Acres	0.00	0	0	52	7	59	
Pickup Truck Use (6 Pickups)	0.38	26	12	0	0	39	
ATV Use	<u>0.19</u>	<u>9</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>10</u>	
TOTAL CULTURAL COSTS	10.38	162	34	550	43	789	
Preharvest:							
Desiccant Application 50% Acre	0.00	0	0	18	4	22	
Take Out Pump & Pipe	2.30	29	0	0	0	29	
Roll Crop	<u>0.11</u>	<u>2</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>4</u>	
TOTAL PREHARVEST COSTS	2.41	31	1	18	4	55	
Harvest:							
Cut Beds	0.14	3	4	0	0	7	
Dig Potatoes	1.00	46	105	0	0	151	
Windrow Potatoes	0.67	15	29	0	0	45	
Bulk Potatoes	3.00	38	0	0	0	38	
Haul From Field	0.50	46	38	0	0	84	
Assessments/Fees	0.00	0	0	80	0	80	
Elevate & Remove Dirt	0.80	18	25	0	0	44	
Holding Tub	0.80	56	7	0	0	63	
Store Potatoes In Shed	0.00	0	0	0	200	200	
Treat For Sprouts on 50% of Acres	<u>0.10</u>	<u>1</u>	<u>0</u>	<u>43</u>	<u>0</u>	<u>44</u>	
TOTAL HARVEST COSTS	7.00	223	208	123	200	754	
Interest on Operating Capital @ 8.75%						60	
TOTAL OPERATING COSTS/ACRE		435	276	1,171	274	2,216	
CASH OVERHEAD:							
Liability Insurance						1	
Office Expense						12	
Field Sanitation						1	
Land Rent						313	
Field Supervisor - 2						55	
Irrigation Pipe Rental						102	
Property Taxes						45	
Property Insurance						33	
Investment Repairs						<u>7</u>	
TOTAL CASH OVERHEAD COSTS						569	
TOTAL CASH COSTS/ACRE						2,785	

UC COOPERATIVE EXTENSION

Table 1. continued

NON-CASH OVERHEAD:			
	Per producing	-- Annual Cost --	
	<u>Acre</u>	<u>Capital Recovery</u>	
Investment			
Shop Building	48	4	4
Storage Building	20	2	2
Fuel Tanks & Pumps - 2	15	1	1
Shop Tools	10	1	1
Portable Pump	8	1	1
Land	3,646	228	228
Semi Truck & Lowbed	24	2	2
Tool Carrier	11	1	1
Truck - Service 2 Ton	26	6	6
Pipe Trailers	23	3	3
Fuel Wagons	1	0	0
Equipment	<u>1,186</u>	<u>162</u>	<u>162</u>
TOTAL NON-CASH OVERHEAD COSTS	5,018	411	411
TOTAL COSTS/ACRE			3,207

Table 2

UC COOPERATIVE EXTENSION
COSTS AND RETURNS PER ACRE TO PRODUCE POTATOES
KLAMATH BASIN IN THE INTERMOUNTAIN REGION- 2008

Labor Rate: \$19.14/hr. machine labor
\$12.51/hr. non-machine labor

Interest Rate: 8.75%
Yield per Acre: 500.0 Cwt

	Quantity/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Potatoes – Fresh Market	500.0	Cwt	7.00	<u>3,500</u>	
TOTAL GROSS RETURNS FOR POTATOES				<u>3,500</u>	
OPERATING COSTS					
Irrigation:					
Water	25.00	AcIn	6.11	153	
Fumigant:					
Vapam HL	36.00	Gal	4.08	147	
Custom:					
Gypsum Application	0.25	Ton	6.00	2	
Apply Fertilizer	1.00	Acre	25.00	25	
Treat Potato Seed	1.00	Cwt	3.25	3	
Air Application	5.15	Acre	8.50	44	
Fertilizer:					
Gypsum	250.00	Lb	0.047	12	
16-20-0	150.00	Lb N	1.63	244	
10-34-0	20.00	Gal	2.23	45	
Potash	150.00	Lb	0.223	33	
Zinc	10.00	Lb	2.18	22	
Copper	10.00	Lb	5.64	56	
Manganese	10.00	Lb	1.54	15	
Calcium Nitrate	10.00	Gal	2.15	22	
APS	15.00	Gal	2.46	37	
Fungicide:					
Vydate L	2.00	Pint	12.82	26	
Quadris	10.00	FIOz	3.12	31	
Ridomil Gold Bravo	3.60	Lb	20.41	73	
Endura	12.00	Oz	4.27	51	
Dithane F45	3.00	Pint	2.13	6	
CIPC	250.00	Cwt	0.17	43	
Herbicide:					
Outlook	5.00	Oz	1.457	7	
Prowl H2O	0.88	Pint	5.024	4	
Matrix DF	1.50	Oz	16.74	25	
Insecticide:					
Sencor 75 DF	1.66	FIOz	1.81	3	
Monitor 4	3.60	Pint	17.56	63	
Bravo Weatherstik	1.50	Pint	5.298	8	
Growth Regulator:					
Royal MH-30	1.06	Gal	49.19	52	
Desiccant:					
Reglone Desiccant	1.00	Pint	17.73	18	
Assessment:					
CPRAB Assessment	500.00	Cwt	0.16	80	
Contract:					
Store Potatoes	500.00	Cwt	0.40	200	
Labor (machine)	10.96	Hrs	19.14	210	
Labor (non-machine)	17.97	Hrs	12.51	225	
Fuel - Gas	3.42	Gal	3.10	11	
Fuel - Diesel	64.68	Gal	2.50	162	
Lube				26	
Machinery repair				78	
Interest on Operating Capital @ 8.75%				<u>60</u>	
TOTAL OPERATING COSTS/ACRE				<u>2,216</u>	
NET RETURNS ABOVE OPERATING COSTS				<u>1,284</u>	

UC COOPERATIVE EXTENSION

Table 2. continued

CASH OVERHEAD COSTS:	
Liability Insurance	1
Office Expense	12
Field Sanitation	1
Land Rent	313
Field Supervisors - 2	55
Irrigation Pipe Rental	102
Property Taxes	45
Property Insurance	33
Investment Repairs	<u>7</u>
TOTAL CASH OVERHEAD COSTS/ACRE	569
TOTAL CASH COSTS/ACRE	2,785
NON-CASH OVERHEAD COSTS (CAPITAL RECOVERY):	
Shop Building	4
Storage Building	2
Fuel Tanks & Pumps	1
Shop Tools	1
Portable Pump	1
Land	228
Semi Truck & Lowbed Trailer	2
Tool Carrier	1
Truck - Service 2 Ton	6
Pipe Trailers	3
Fuel Wagons	0
Equipment	<u>162</u>
TOTAL NON-CASH OVERHEAD COSTS/ACRE	411
TOTAL COSTS/ACRE	3,207
NET RETURNS ABOVE TOTAL COSTS	293

[§] Total returns will vary across farms because of differing support under government programs.

UC COOPERATIVE EXTENSION
MONTHLY CASH COSTS PER ACRE TO PRODUCE POTATO
KLAMATH BASIN IN THE INTERMOUNTAIN REGION- 2008

Table 3.

Beginning SEP 07	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	TOTAL
Ending OCT 08	07	07	07	07	08	08	08	08	08	08	08	08	08	08	08
Preplant:															
Land Prep: Chop Crop Residue on 80% of Acres	10														10
Land Prep: Stubble Disc Field 1.5X	15														15
Land Prep: Rip 1.5X on 25% of Acres	7														7
Land Prep: Pre-irrigate	55														55
Land Prep: Rotospike & Vapam 25% of Acre	4														4
Land Prep: Apply Gypsum on 25% of Acres		13													13
Land Prep: Chisel 25% of Acres								2							2
Land Prep: Rotospike & Vapam (65%) 75% of Acres								12							12
Fertilize Beds									441						441
TOTAL PREPLANT COSTS	90	13						14	441						559
Cultural:															
Plant Potatoes									81						81
Weed Control - Cultivate									8						8
Irrigate & Fertilize										100					100
Weed Control - Outlook & Prowl on 25% of Acres										27					27
Insect Control - Sencor & Matrix										45					45
Disease Control - Ridomil Gold Bravo on 90% of Acres										54					54
Irrigate											19	62	28		109
Insect Control - Monitor 2X - on 90% of Acres											39	39			79
Disease Control - Endura 2X											90				90
Disease Control - Ridomil Gold Bravo on 90% of Acres											56				56
Disease Control - Dithane												15			15
Disease Control - Bravo												16			16
Growth Regulator - Royal on 85% of Acres												59			59
Pickup Truck Use (6 Pickups)														39	39
ATV Use	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10
TOTAL CULTURAL COSTS	1	1	1	1	1	1	1	1	90	227	206	192	29	39	789
Preharvest:															
Desiccant Application on 50% of Acres													22		22
Take Out Pump & Pipe													29		29
Roll Crop													4		4
TOTAL PREHARVEST COSTS													55		55
Harvest:															
Cut Beds														7	7
Dig Potatoes														151	151
Windrow Potatoes														45	45
Bulk Potatoes														38	38
Haul From Field														84	84
Assessments/Fees														80	80
Elevate & Remove Dirt														44	44
Holding Tub														63	63
Store Potatoes In Shed														200	200
Treat For Sprouts on 50% of Acres														44	44
TOTAL HARVEST COSTS														754	754
Interest on Operating Capital @ 8.75%	1	1	1	1	1	1	1	1	5	6	8	9	10	16	60
TOTAL OPERATING COSTS/ACRE	92	15	1	2	2	2	2	15	536	233	214	202	93	809	2,216
CASH OVERHEAD:															
Liability Insurance					1										1
Office Expense	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
Field Sanitation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Land Rent	313														313
Field Supervisor - 2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	55
Irrigation Pipe Rental	7	7	7	7	7	7	7	7	7	7	7	7	7	7	102
Property Taxes						23					23				45
Property Insurance						17					17				33
Investment Repairs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	7
TOTAL CASH OVERHEAD COSTS	325	13	13	13	14	52	13	13	13	13	52	13	12	12	569
TOTAL CASH COSTS/ACRE	417	27	14	14	15	54	14	28	549	246	266	214	105	821	2,785

Table 4.

UC COOPERATIVE EXTENSION
WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS
KLAMATH BASIN IN THE INTERMOUNTAIN REGION- 2008

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	- Cash Overhead -			Total
						Insur- ance	Taxes		
08	125 HP 4WD Tractor	82,000	10	24,222	9,457	393	531		10,381
08	150 HP 4WD Tractor	115,000	10	33,969	13,263	551	745		14,559
08	175 HP 4WD Tractor	140,000	10	41,354	16,147	671	907		17,724
08	200 HP 4WD Tractor	170,000	10	50,215	19,608	815	1,101		21,522
08	225 HP 4WD Tractor	182,000	10	53,760	20,991	872	1,179		23,042
08	75 HP 4WD Tractor	42,500	10	12,554	4,902	204	275		5,381
08	ATV	4,273	5	1,915	683	23	31		737
08	ATV	4,273	5	1,915	683	23	31		737
08	Bed Shaper	13,292	10	2,351	1,651	58	78		1,787
08	Chisel - 20'	28,500	10	5,040	3,540	124	168		3,832
08	Cultivator - Sled	4,980	10	881	619	22	29		670
08	Digger - 2 Row Potato	70,000	5	4,946	15,858	277	375		16,510
08	Disc - Stubble 15'	21,000	10	3,714	2,609	91	124		2,824
08	Elevator	55,000	10	9,726	6,832	239	324		7,395
08	Holding Tub	70,000	10	12,379	8,696	305	412		9,412
08	Mower - Flail - 15	28,000	10	4,952	3,478	122	165		3,765
08	Pickup 1/2 Ton	22,757	5	10,199	3,639	122	165		3,926
08	Pickup 1/2 Ton	22,757	5	10,199	3,639	122	165		3,926
08	Pickup 1/2 Ton	22,757	5	10,199	3,639	122	165		3,926
08	Pickup 1/2 Ton	22,757	5	10,199	3,639	122	165		3,926
08	Pickup 3/4 Ton	27,112	5	12,151	4,335	145	196		4,677
08	Pickup 3/4 Ton	27,112	5	12,151	4,335	145	196		4,677
08	Planter - 4 Row Potato	55,000	10	9,726	6,832	239	324		7,395
08	Potato Truck - 20' Bed	23,000	10	6,794	2,653	110	149		2,912
08	Potato Truck - 20' Bed	23,000	10	6,794	2,653	110	149		2,912
08	Potato Truck - 20' Bed	23,000	10	6,794	2,653	110	149		2,912
08	Potato Truck - 20' Bed	23,000	10	6,794	2,653	110	149		2,912
08	Ripper - 14'	29,000	10	5,128	3,602	126	171		3,899
08	Roller - Flat -15'	7,500	10	1,326	932	33	44		1,008
08	Rotospike - 15"	29,000	10	5,128	3,602	126	171		3,899
08	Windrower - Potato	50,000	10	8,842	6,211	218	294		6,723
TOTAL		1,438,570		386,317	184,032	6,752	9,124		199,909
55% of New Cost *		791,213		212,474	101,218	3,714	5,018		109,950

*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								
Fuel Tanks & Pumps	21,949	20	2,195	1,895	89	121	439	2,544
Fuel Wagons	2,186	10	219	284	9	12	44	349
Land	175,000	20	175,000	10,938	1,295	1,750	0	13,983
Pipe Trailers	35,000	10	700	4,759	132	178	700	5,770
Portable Pump	11,774	20	1,177	1,016	48	65	589	1,718
Semi Truck & Lowbed Trailer	36,170	15	3,617	3,633	147	199	531	4,510
Shop Building	72,168	25	7,217	5,653	294	397	722	7,066
Shop Tools	14,465	20	1,447	1,249	59	80	145	1,532
Storage Building	29,112	20	2,911	2,513	118	160	586	3,377
Tool Carrier	16,730	15	1,673	1,680	68	92	837	2,677
Truck - Service 2 Ton	38,600	5	3,860	8,545	157	212	3,860	12,774
TOTAL INVESTMENT	453,154		200,016	42,165	2,416	3,266	8,453	56,300

UC COOPERATIVE EXTENSION

Table 4. continued

ANNUAL BUSINESS OVERHEAD COSTS				
Description	Units/		Price/	Total
	Farm	Unit	Unit	Cost
Field Sanitation	1,500	Acre	1.00	1,500
Field Supervisors - 2	1,500	Acre	54.67	82,005
Irrigation Pipe Rental	1,500	Acre	101.28	151,920
Land Rent	200	Acre	300.00	60,000
Liability Insurance	1,500	Acre	0.90	1,350
Office Expense	1,500	Acre	12.00	18,000

Table 5.

UC COOPERATIVE EXTENSION
HOURLY EQUIPMENT COSTS
KLAMATH BASIN IN THE INTERMOUNTAIN REGION- 2008

----- COSTS PER HOUR -----									
Yr	Description	Actual	- Cash Overhead -			----- Operating -----		Total	Total
		Hours Used	Capital Recovery	Insur- ance	Taxes	Repairs	Fuel & Lube		
08	125 HP 4WD Tractor	1,585.2	3.28	0.14	0.18	1.95	20.86	22.81	26.41
08	150 HP 4WD Tractor	1,597.7	4.57	0.19	0.26	2.73	25.03	27.76	32.78
08	175 HP 4WD Tractor	1,598.7	5.55	0.23	0.31	3.33	29.20	32.53	38.63
08	200 HP 4WD Tractor	1,586.2	6.80	0.28	0.38	4.04	33.37	37.41	44.88
08	225 HP 4WD Tractor	1,596.4	7.23	0.30	0.41	4.33	37.54	41.87	49.81
08	75 HP 4WD Tractor	1,598.8	1.69	0.07	0.09	1.01	10.59	11.60	13.45
08	ATV	283.0	1.33	0.04	0.06	0.25	3.56	3.81	5.25
08	ATV	283.0	1.33	0.04	0.06	0.25	3.56	3.81	5.25
08	Bed Shaper	198.4	4.58	0.16	0.22	2.54	0.00	2.54	7.49
08	Chisel - 20'	199.3	9.77	0.34	0.46	5.50	0.00	5.50	16.07
08	Cultivator - Sled	198.4	1.71	0.06	0.08	0.95	0.00	0.95	2.81
08	Digger - 2 Row Potato	266.2	32.76	0.57	0.77	24.64	33.37	58.01	92.12
08	Disc - Stubble 15'	198.3	7.24	0.25	0.34	3.11	0.00	3.11	10.95
08	Elevator	193.6	19.41	0.68	0.92	6.74	0.00	6.74	27.75
08	Holding Tub	193.6	24.70	0.87	1.17	8.58	0.00	8.58	35.32
08	Mower - Flail - 15	198.0	9.66	0.34	0.46	10.61	0.00	10.61	21.07
08	Pickup 1/2 Ton	283.0	7.07	0.24	0.32	1.35	8.91	10.26	17.89
08	Pickup 1/2 Ton	283.0	7.07	0.24	0.32	1.35	8.91	10.26	17.89
08	Pickup 1/2 Ton	283.0	7.07	0.24	0.32	1.35	8.91	10.26	17.89
08	Pickup 1/2 Ton	283.0	7.07	0.24	0.32	1.35	8.91	10.26	17.89
08	Pickup 3/4 Ton	283.0	8.43	0.28	0.38	1.61	10.70	12.31	21.40
08	Pickup 3/4 Ton	283.0	8.43	0.28	0.38	1.61	10.70	12.31	21.40
08	Planter - 4 Row Potato	60.5	62.11	2.18	2.94	13.52	0.00	13.52	80.75
08	Potato Truck - 20' Bed	121.0	12.06	0.50	0.68	1.67	17.25	18.92	32.15
08	Potato Truck - 20' Bed	121.0	12.06	0.50	0.68	1.67	17.25	18.92	32.15
08	Potato Truck - 20' Bed	121.0	12.06	0.50	0.68	1.67	17.25	18.92	32.15
08	Potato Truck - 20' Bed	121.0	12.06	0.50	0.68	1.67	17.25	18.92	32.15
08	Ripper - 14'	198.5	9.98	0.35	0.47	5.99	0.00	5.99	16.80
08	Roller - Flat -15'	199.1	2.57	0.09	0.12	0.78	0.00	0.78	3.57
08	Rotospike - 15"	148.3	13.36	0.47	0.63	7.76	0.00	7.76	22.22
08	Windrower - Potato	161.3	21.17	0.74	1.00	18.70	0.00	18.70	41.62

Table 6.

UC COOPERATIVE EXTENSION
RANGING ANALYSIS WITH USDA PAYMENTS
KLAMATH BASIN IN THE INTERMOUNTAIN REGION- 2008

COSTS PER ACRE AT VARYING YIELD TO PRODUCE FRESH MARKET POTATOES							
	YIELD (CWT/ACRE)						
	350	400	450	500	550	600	650
OPERATING COSTS/ACRE:							
Preplant Cost	559	559	559	559	559	559	559
Cultural Cost	789	789	789	789	789	789	789
Pre-harvest Cost	55	55	55	55	55	55	55
Harvest Cost	528	603	678	754	829	905	980
Interest on operating capital	59	59	60	60	61	61	62
TOTAL OPERATING COSTS/ACRE	1,988	2,064	2,140	2,216	2,292	2,368	2,444
TOTAL OPERATING COSTS/TON	5.68	5.16	4.76	4.43	4.17	3.95	3.76
CASH OVERHEAD COSTS/ACRE	569	569	569	569	569	569	569
TOTAL CASH COSTS/ACRE	2,557	2,633	2,709	2,785	2,861	2,937	3,013
TOTAL CASH COSTS/TON	7.31	6.58	6.02	5.57	5.20	4.89	4.64
NON-CASH OVERHEAD COSTS/ACRE	419	421	422	423	423	424	425
TOTAL COSTS/ACRE	2,976	3,053	3,130	3,207	3,284	3,361	3,438
TOTAL COSTS/TON	8.50	7.63	6.96	6.41	5.97	5.60	5.29

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR FRESH MARKET POTATOES

PRICE (DOLLARS/CWT)	YIELD (CWT/ACRE)						
	350	400	450	500	550	600	650
Fresh Market Potatoes							
5.50	-63	136	335	534	733	932	1,131
6.00	112	336	560	784	1,008	1,232	1,456
6.50	287	536	785	1,034	1,283	1,532	1,781
7.00	462	736	1,010	1,284	1,558	1,832	2,106
7.50	637	936	1,235	1,534	1,833	2,132	2,431
8.00	812	1,136	1,460	1,784	2,108	2,432	2,756
8.50	987	1,336	1,685	2,034	2,383	2,732	3,081

NET RETURNS PER ACRE ABOVE CASH COSTS FOR FRESH MARKET POTATOES

PRICE (DOLLARS/CWT)	YIELD (CWT/ACRE)						
	350	400	450	500	550	600	650
Fresh Market Potatoes							
5.50	-632	-433	-234	-35	164	363	562
6.00	-457	-233	-9	215	439	663	887
6.50	-282	-33	216	465	714	963	1,212
7.00	-107	167	441	715	989	1,263	1,537
7.50	68	367	666	965	1,264	1,563	1,862
8.00	243	567	891	1,215	1,539	1,863	2,187
8.50	418	767	1,116	1,465	1,814	2,163	2,512

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR FRESH MARKET POTATOES

PRICE (DOLLARS/CWT)	YIELD (CWT/ACRE)						
	350	400	450	500	550	600	650
Fresh Market Potatoes							
5.50	-1,051	-853	-655	-457	-259	-61	137
6.00	-876	-653	-430	-207	16	239	462
6.50	-701	-453	-205	43	291	539	787
7.00	-526	-253	20	293	566	839	1,112
7.50	-351	-53	245	543	841	1,139	1,437
8.00	-176	147	470	793	1,116	1,439	1,762
8.50	-1	347	695	1,043	1,391	1,739	2,087

Table 7.

UC COOPERATIVE EXTENSION
 COSTS AND RETURNS/BREAKEVEN ANALYSIS
 KLAMATH BASIN IN THE INTERMOUNTAIN REGION- 2008

COSTS AND RETURNS - PER ACRE BASIS

Crop	1. Gross Returns	2. Operating Costs	3. Net Returns Above Oper. Costs (1-2)	4. Cash Costs	5. Net Returns Above Cash Costs (1-4)	6. Total Costs	7. Net Returns Above Total Costs (1-6)
Fresh Market Potatoes	3,500	2,216	1,284	2,785	715	3,207	293

COSTS AND RETURNS - TOTAL ACREAGE

Crop	1. Gross Returns	2. Operating Costs	3. Net Returns Above Oper. Costs (1-2)	4. Cash Costs	5. Net Returns Above Cash Costs (1-4)	6. Total Costs	7. Net Returns Above Total Costs (1-6)
Fresh Market Potatoes	847,000	536,263	310,737	673,952	173,048	776,210	70,790

BREAKEVEN PRICES PER YIELD UNIT

Crop	Base Yield (Units/Acre)	Yield Units	----- Breakeven Price To Cover -----		
			Operating Costs	Cash Costs	Total Costs
----- \$ per Yield Unit -----					
Fresh Market Potatoes	500.0	Cwt	4.43	5.57	6.41

BREAKEVEN YIELDS PER ACRE

Crop	Yield Units	Base Price (\$/Unit)	----- Breakeven Yield To Cover -----		
			Operating Costs	Cash Costs	Total Costs
----- Yield Units / Acre -----					
Fresh Market Potatoes	Cwt	7.00	316.6	397.8	458.2

UC COOPERATIVE EXTENSION
 DETAILS OF OPERATIONS TO PRODUCE POTATO
 KLAMATH BASIN IN THE INTERMOUNTAIN REGION- 2008

Table 8.

Operation	Operation Month	Tractor/ Power Unit	Implement	Material	Broadcast Rate/acre	Material Unit
Cultural:						
Land Preparation – Chop Crop Residue - - 80% of Acres	September	150 HP 4WD Tractor	Mower - Flail - 15			
Land Preparation - Stubble Disc 1.5X	September	200 HP 4WD Tractor	Disc - Stubble 15'			
Land Preparation - Rip 1.5X - - 25% of Acres	September	150 HP 4WD Tractor	Ripper - 14'			
Land Preparation - Pre-irrigate	September			Water	2.00	AcIn
Land Preparation - Rotospike & Vapam - 25% of Acres	September	200 HP 4WD Tractor	Rotospike - 15"	Vapam HL	10.00	Gal
Land Preparation - Apply Gypsum	September	Contract	Gypsum Application	Gypsum	250.00	Lbs
Land Preparation - Chisel 25% of Acres	April	200 HP 4WD Tractor	Chisel - 20'			
Land Preparation - Rotospike & Vapam - - 75% of Acres	April	200 HP 4WD Tractor	Rotospike - 15"	Vapam HL	26.00	Gal
Fertilize Beds	May	Contract	Fertilizer Application	16-20-0	150.00	Lb N
				10-34-0	20.00	Gal
				Potash	150.00	Lbs
				Zinc	20.00	Lbs
				Copper	10.00	Lbs
				Manganese	10.00	Lbs
Plant Potatoes	May	225 HP 4WD Tractor	Planter - 4 Row Potato	Vydate L	2.00	Pint
				Quadris	10.00	FIOz
Weed Control - Cultivate	May	175 HP 4WD Tractor	Cultivator - Sled 6 Row			
Chemigate - Fertilizer/Pesticide	June	Labor		Water	1.38	AcIn
				Calcium Nitrate	10.00	Gal
				APS	15.00	Gal
Irrigate	July	Labor		Water	2.00	AcIn
	August	Labor		Water	6.50	AcIn
	September	Labor		Water	3.00	AcIn
Weed Control - Goal + Prowl & Irrigate	June	Labor		Outlook	5.00	Oz
				Prowl H2O	0.88	Pint
				Water	1.38	AcIn
Insect Control & Irrigate	June	Labor		Sencor 75	1.66	Oz
				Matrix DF	1.50	FIOz
				Water	1.38	AcIn
Disease Control & Irrigate	June	Labor		Water	1.75	AcIn
				Ridomil Gold		
- Ridomil Gold Bravo'				Bravo	1.80	Lbs
Insect Control - Monitor on 90% of Acres	July	Air Application		Monitor 4	1.80	Pint
	August	Air Application		Monitor 4	1.80	Pint
Disease Control & Irrigate - Endura 2X	July	Labor		Endura	6.00	FIOz
				Water	2.00	AcIn
	July	Labor		Endura	6.00	FIOz
				Water	2.00	AcIn
Disease Control & Irrigate	July	Labor		Water	2.00	AcIn
				Ridomil Gold		
- Ridomil Gold Bravo on 90% of Acres				Bravo	1.80	Lbs
Disease Control - Dithane	August	Air Application		Dithane F45	1.50	Pint
Disease Control - Bravo Weatherstik	August	Air Application		Bravo Weatherstik	1.50	Pint
Growth Regulator - - Royal MH-30 on 85% of Acres	August	Air Application		Royal MH-30	1.06	Gal
Desiccant Application - 50% of Acres	September	Air Application		Reglone Desiccant	1.00	Pint
Take Out Pump & Pipe	September	Labor			2.30	Hrs
Roll Crop	October	75 HP 4WD Tractor	Flat Roller - 15'			
Cut Beds	October	125 HP 4WD Tractor	Cultivator - Sled 6 Row			
Dig Potatoes	October	200 HP 4WD Tractor	Digger - 2 Row Potato			
Windrow Potatoes	October	200 HP 4WD Tractor	Windrower - Potato			
Bulk Potatoes	October	Labor			3.00	Hrs
Haul From Field	October	Potato Truck - 20' Bed (4)				
Assessment/Fees	October	CPRAB Assessment			500.00	Cwt
Elevate & Remove Dirt	October	125 HP 4WD Tractor	Elevator			
Holding Tub	October	Labor	Holding Tub		3.00	Hrs
Store Potatoes in Shed	October	Contract			500.00	Cwt
Treat For Sprouts	October	Labor		CIPC	250.00	Cwt
Pickup Truck Use (6 Pickups)	All	Pickup - 1/2 Ton (4) Pickup - 3/4 Ton (2)				
ATV Use (2 ATVs)	All	ATV (2)				