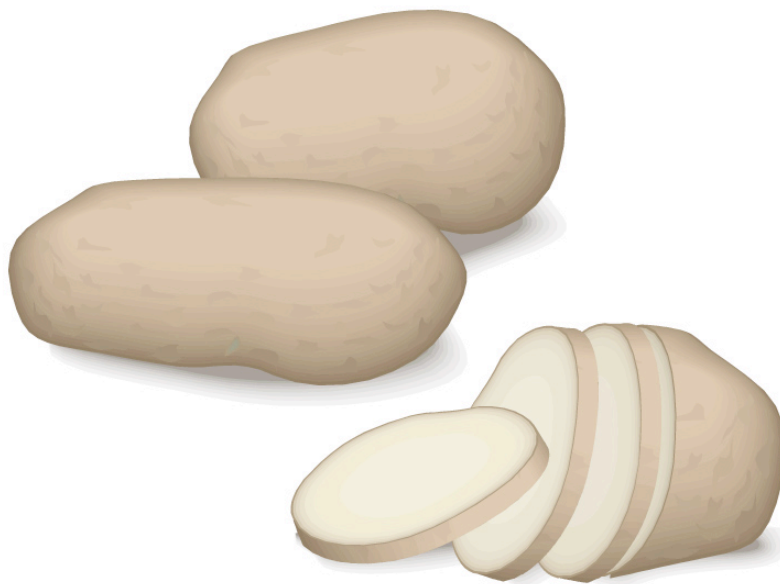

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2008

SAMPLE COSTS TO PRODUCE

POTATOES



CHIPPERS for PROCESSING IN THE KLAMATH BASIN OF THE INTERMOUNTAIN REGION

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INTRODUCTION

The sample costs to grow potatoes in the Klamath Basin of the Intermountain Region bound for processing (chippers) 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. An additional cost of production study for fresh market potatoes grown in this region is also available: “*Sample Costs To Produce Potatoes, Fresh Market, Klamath Basin Of The Intermountain Region - 2008*”.

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 grow potatoes for the processing market (also known as chippers) 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 acre 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 moved once during the growing season to cultivate the beds. 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 a custom service for \$3.25 per hundredweight (cwt). The seed stock cost \$13.00 per cwt and is planted at a density of 33 cwt per acre. 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 33 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 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 insecticide treatment consists of Monitor to control worms and aphids sprayed by aircraft over 90% of the acreage. The application 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 are 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 25% 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. Harvested potatoes are loaded into trucks in the field and hauled to storage sheds, assumed to be 15 miles away round trip. 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 \$0.45 per cwt annually. Most potatoes are stored in the sheds for only four months. During storage the potatoes are treated to prevent Fusarium rot by treating 80% of the yield at a cost of \$3.02 per cwt. Sprouting is prevented by applying an inhibitor on 50% of the yield and the grower is charged \$0.07 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 \$7.75 per cwt of processing potato is used to estimate income.

Table A. Average Tulelake potato yields and price

Potatoes –			
(Processing - Chippers)	Acres	Yields	Price
--- Year ---		-- Cwt/Acre --	--- \$/Cwt ---
2002	3,023	493	\$5.50
2003	4,499	391	\$5.50
2004	3,591	391	\$5.50
2005	4,403	365	\$6.35
2006	<u>4,810</u>	<u>425</u>	<u>\$5.10</u>
5 Year Average	4,065	413	\$5.59

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 processing (chipper) 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 \$18.73 per hour for machine operators and \$12.24 for non-machine workers includes payroll overhead of 36%. 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 \$3.54 and \$3.57 per gallon, respectively. Fuel costs are derived from American Automobile Association (AAA) and Energy Information Administration (EIA) 2007 - 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 6.75% 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 \$1,350 for the entire farm or \$0.90 per acre.

Office Expense. Office and business expenses are estimated at \$12.33 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 \$350 per 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:

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

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 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 4.25% is used to calculate capital recovery cost is the effective long term interest rate in April, 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.

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UC COOPERATIVE EXTENSION
 COSTS PER ACRE TO PRODUCE POTATOES
 KLAMATH BASIN IN THE INTERMOUNTAIN REGION- 2008
 CHIPPERS FOR PROCESSING

Table 1.

Labor Rate: \$18.73/hr. machine labor
 \$12.24/hr. non-machine labor

Interest Rate: 6.75%
 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	8	0	0	12		
Land Preparation: Stubble Disc Field 1.5X	0.22	5	13	0	0	18		
Land Preparation: Rip 1.5X on 25% of Acres	0.10	2	7	0	0	9		
Land Preparation: Pre-irrigate	0.15	2	0	12	0	14		
Land Preparation: Rotospike & Vapam 25% of Acre	0.05	1	3	41	0	46		
Land Preparation: Apply Gypsum on 25% of Acres	0.00	0	0	12	2	13		
Land Preparation: Chisel 25% of Acres	0.03	1	2	0	0	3		
Land Preparation: Rotospike & Vapam (65%) 75% of Acres	0.16	4	10	106	0	120		
Fertilize Beds	0.00	0	0	335	25	360		
TOTAL PREPLANT COSTS	0.86	18	44	506	27	594		
Cultural:								
Plant Potatoes	0.25	6	19	486	3	514		
Weed Control - Cultivate	0.14	3	7	0	0	10		
Irrigate & Fertilize	2.60	33	0	68	0	100		
Weed Control - Outlook & Prowl on 25% of Acres	0.50	6	0	21	0	27		
Weed Control- Matrix on 50% of Acres	0.50	6	0	36	0	42		
Disease Control - Ridomil Gold Bravo on 90% of Acres	0.50	6	0	47	0	54		
Irrigate	3.58	45	0	64	0	109		
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		
Insect Control - Monitor 2X - on 90% of Acres	0.00	0	0	32	8	39		
Disease Control - Dithane	0.00	0	0	6	9	15		
Disease Control - Bravo	0.00	0	0	8	9	16		
Growth Regulator - Royal on 25% of Acres	0.00	0	0	15	2	17		
Pickup Truck Use (6 Pickups)	0.38	26	14	0	0	40		
ATV Use	0.19	9	2	0	0	10		
TOTAL CULTURAL COSTS	10.38	162	42	907	30	1,141		
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	0.11	2	2	0	0	4		
TOTAL PREHARVEST COSTS	2.41	31	2	18	4	55		
Harvest:								
Cut Beds	0.14	3	5	0	0	8		
Dig Potatoes	1.00	46	136	0	0	182		
Windrow Potatoes	0.67	15	36	0	0	51		
Bulk Potatoes	3.00	38	0	0	0	38		
Haul From Field	0.50	46	52	0	0	98		
Assessments/Fees	0.00	0	0	80	0	80		
Elevate & Remove Dirt	0.80	18	33	0	0	52		
Holding Tub	0.80	56	7	0	0	63		
Treat For Fusarium (Storage) on 80 % of Yield	0.00	0	0	0	0	0		
Store Potatoes In Shed	0.00	0	0	0	200	200		
Treat For Sprouts on 50% of Yield	0.10	1	0	18	0	19		
TOTAL HARVEST COSTS	7.00	223	269	98	200	790		
Interest on Operating Capital @ 6.75%						62		
TOTAL OPERATING COSTS/ACRE		435	357	1,529	261	2,643		

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Table 1. continued

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>6</u>
TOTAL CASH OVERHEAD COSTS			567
TOTAL CASH COSTS/ACRE			<u>3,209</u>
NON-CASH OVERHEAD:			
	Per producing	-- Annual Cost --	
Investment	<u> Acre</u>	<u>Capital Recovery</u>	
Shop Building	48	3	3
Storage Building	20	1	1
Fuel Tanks & Pumps - 2	15	1	1
Shop Tools	10	1	1
Portable Pump	8	1	1
Land	3,646	155	155
Semi Truck & Lowbed	24	2	2
Tool Carrier	11	1	1
Truck - Service 2 Ton	26	5	5
Pipe Trailers	23	3	3
Fuel Wagons	1	0	0
Equipment	<u>1,186</u>	<u>145</u>	<u>145</u>
TOTAL NON-CASH OVERHEAD COSTS	5,018	319	319
TOTAL COSTS/ACRE			<u>3,528</u>

Table 2

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

Labor Rate: \$18.73/hr. machine labor
 \$12.24/hr. non-machine labor

Interest Rate: 6.75%
 Yield per Acre: 500.0 Cwt

	Quantity/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Potatoes for Processing	500.0	Cwt	7.75	<u>3,875</u>	
TOTAL GROSS RETURNS FOR POTATOES				<u>3,875</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	3.65	Acre	8.50	31	
Fertilizer:					
Gypsum	250.00	Lb	0.047	12	
16-20-0	100.00	Lb N	1.63	163	
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	
Seed:					
Seed Potatoes	33.00	Cwt	13.00	429	
Fungicide:					
Vydate L	2.00	Pint	12.82	26	
Quadris	10.00	FLOz	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	
Mertect 340-F	0.11	FLOz	3.02	0	
Sprout Inhibitor	250.00	Cwt	0.07	18	
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:					
Monitor 4	1.80	Pint	17.56	32	
Bravo Weatherstik	1.50	Pint	5.298	8	
Growth Regulator:					
Royal MH-30	0.31	Gal	49.19	15	
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	3.57	12	
Fuel - Diesel	64.67	Gal	3.54	229	
Lube				36	
Machinery repair				79	
Interest on Operating Capital @ 6.75%				<u>62</u>	
TOTAL OPERATING COSTS/ACRE				<u>2,643</u>	
NET RETURNS ABOVE OPERATING COSTS				<u>1,232</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	6
TOTAL CASH OVERHEAD COSTS/ACRE	567
TOTAL CASH COSTS/ACRE	3,209
NON-CASH OVERHEAD COSTS (CAPITAL RECOVERY):	
Shop Building	3
Storage Building	1
Fuel Tanks & Pumps	1
Shop Tools	1
Portable Pump	1
Land	155
Semi Truck & Lowbed Trailer	2
Tool Carrier	1
Truck - Service 2 Ton	5
Pipe Trailers	3
Fuel Wagons	0
Equipment	145
TOTAL NON-CASH OVERHEAD COSTS/ACRE	319
TOTAL COSTS/ACRE	3,528
NET RETURNS ABOVE TOTAL COSTS	347

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

UC COOPERATIVE EXTENSION
MONTHLY CASH COSTS PER ACRE TO PRODUCE POTATOES
KLAMATH BASIN IN THE INTERMOUNTAIN REGION- 2008
CHIPPERS FOR PROCESSING

Table 3.

Beginning SEP 06	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	TOTAL
Ending OCT 07	07	07	07	07	08	08	08	08	08	08	08	08	08	08	
Preplant:															
Land Prep: Chop Crop Residue on 80% of Acres	12														12
Land Prep: Stubble Disc Field 1.5X	18														18
Land Prep: Rip 1.5X on 25% of Acres	9														9
Land Prep: Pre-irrigate	14														14
Land Prep: Rotospike & Vapam 25% of Acre	46														46
Land Prep: Apply Gypsum on 25% of Acres		13													13
Land Prep: Chisel 25% of Acres								3							3
Land Prep: Rotospike & Vapam (65%) 75% of Acres								120							120
Fertilize Beds									360						360
TOTAL PREPLANT COSTS	98	13						123	360						594
Cultural:															
Plant Potatoes									514						514
Weed Control - Cultivate									10						10
Irrigate & Fertilize										100					100
Weed Control - Outlook & Prowl on 25% of Acres										27					27
Weed Control- Matrix on 50% of Acres										42					42
Disease Control - Ridomil Gold Bravo on 90% of Acres										54					54
Irrigate											19	62	28		109
Disease Control - Endura 2X											90				90
Disease Control - Ridomil Gold Bravo on 90% of Acres											56				56
Insect Control - Monitor 2X - on 90% of Acres												39			39
Disease Control - Dithane												15			15
Disease Control - Bravo												16			16
Growth Regulator - Royal on 85% of Acres												17			17
Pickup Truck Use (6 Pickups)														40	40
ATV Use	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>10</u>
TOTAL CULTURAL COSTS	1	1	1	1	1	1	1	1	525	224	167	150	29	41	1,141
Preharvest:															
Dessicant Application on 50% of Acres														22	22
Take Out Pump & Pipe														29	29
Roll Crop														<u>4</u>	<u>4</u>
TOTAL PREHARVEST COSTS														55	55
Harvest:															
Cut Beds															8
Dig Potatoes															182
Windrow Potatoes															51
Bulk Potatoes															38
Haul From Field															98
Assessments/Fees															80
Elevate & Remove Dirt															52
Holding Tub															63
Treat For Fusarium (Storage) on 80% of Yield															0
Store Potatoes In Shed															200
Treat For Sprouts on 25% of Yield															<u>19</u>
TOTAL HARVEST COSTS															790
Interest on Operating Capital @ 8.75%	1	1	1	1	1	1	1	1	6	8	9	9	10	15	62
TOTAL OPERATING COSTS/ACRE	99	15	1	1	1	1	1	125	891	231	175	160	94	846	2,643
CASH OVERHEAD:															
Liability Insurance					1										1
Office Expense				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			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	8	8	8	8	8	8	8	8	8	8	8	8			102
Property Taxes						22						22			45
Property Insurance						17						17			33
Investment Repairs	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>			<u>6</u>
TOTAL CASH OVERHEAD COSTS	326	14	14	14	15	53	14	14	14	14	53	14	5	5	567
TOTAL CASH COSTS/ACRE	426	28	15	15	16	54	15	139	905	245	228	174	98	850	3,209

Table 4.

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

ANNUAL EQUIPMENT COSTS								
Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	- Cash Overhead -		
						Insur- ance	Taxes	Total
07	125 HP 4WD Tractor	82,000	10	24,222	8,242	393	531	9,166
07	150 HP 4WD Tractor	115,000	10	33,969	11,559	551	745	12,855
07	175 HP 4WD Tractor	140,000	10	41,354	14,071	671	907	15,649
07	200 HP 4WD Tractor	170,000	10	50,215	17,087	815	1,101	19,003
07	225 HP 4WD Tractor	182,000	10	53,760	18,293	872	1,179	20,344
07	75 HP 4WD Tractor	42,500	10	12,554	4,272	204	275	4,751
07	ATV	4,273	5	1,915	615	23	31	669
07	ATV	4,273	5	1,915	615	23	31	669
07	Bed Shaper	13,292	10	2,351	1,466	58	78	1,602
07	Chisel - 20'	28,500	10	5,040	3,143	124	168	3,435
07	Cultivator - Sled	4,980	10	881	549	22	29	600
07	Digger - 2 Row Potato	70,000	5	4,946	14,926	277	375	15,578
07	Disc - Stubble 15'	21,000	10	3,714	2,316	91	124	2,531
07	Elevator	55,000	10	9,726	6,065	239	324	6,628
07	Holding Tub	70,000	10	12,379	7,719	305	412	8,436
07	Mower - Flail - 15	28,000	10	4,952	3,088	122	165	3,374
07	Pickup 1/2 Ton	22,757	5	10,199	3,274	122	165	3,561
07	Pickup 1/2 Ton	22,757	5	10,199	3,274	122	165	3,561
07	Pickup 1/2 Ton	22,757	5	10,199	3,274	122	165	3,561
07	Pickup 1/2 Ton	22,757	5	10,199	3,274	122	165	3,561
07	Pickup 3/4 Ton	27,112	5	12,151	3,901	145	196	4,242
07	Pickup 3/4 Ton	27,112	5	12,151	3,901	145	196	4,242
07	Planter - 4 Row Potato	55,000	10	9,726	6,065	239	324	6,628
07	Potato Truck - 20' Bed	23,000	10	6,794	2,312	110	149	2,571
07	Potato Truck - 20' Bed	23,000	10	6,794	2,312	110	149	2,571
07	Potato Truck - 20' Bed	23,000	10	6,794	2,312	110	149	2,571
07	Potato Truck - 20' Bed	23,000	10	6,794	2,312	110	149	2,571
07	Ripper - 14'	29,000	10	5,128	3,198	126	171	3,495
07	Roller - Flat -15'	7,500	10	1,326	827	33	44	904
07	Rotospike - 15"	29,000	10	5,128	3,198	126	171	3,495
07	Windrower - Potato	50,000	10	8,842	5,514	218	294	6,025
TOTAL		1,438,570		386,317	162,970	6,752	9,124	178,846
55% of New Cost *		791,213		212,474	89,633	3,714	5,018	98,366

*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	1,579	89	121	439	2,228
Fuel Wagons	2,186	10	219	255	9	12	44	320
Land	175,000	20	175,000	7,438	1,295	1,750	0	10,482
Pipe Trailers	35,000	10	700	4,311	132	178	700	5,322
Portable Pump	11,774	20	1,177	847	48	65	589	1,549
Semi Truck & Lowbed Trailer	36,170	15	3,617	3,133	147	199	531	4,010
Shop Building	72,168	25	7,217	4,575	294	397	722	5,988
Shop Tools	14,465	20	1,447	1,041	59	80	145	1,324
Storage Building	29,112	20	2,911	2,095	118	160	586	2,959
Tool Carrier	16,730	15	1,673	1,449	68	92	837	2,446
Truck - Service 2 Ton	38,600	5	3,860	8,022	157	212	3,860	12,252
TOTAL INVESTMENT	453,154		200,016	34,745	2,417	3,266	8,453	48,880

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
 CHIPPERS FOR PROCESSING

----- COSTS PER HOUR -----										
Yr	Description	Actual	- Cash Overhead -				----- Operating -----		Total	Total
		Hours Used	Capital Recovery	Insur- ance	Taxes	Repairs	Fuel & Lube	Total Oper.		
07	125 HP 4WD Tractor	1,585.2	2.86	0.14	0.18	2.02	29.53	31.55	34.73	
07	150 HP 4WD Tractor	1,597.7	3.98	0.19	0.26	2.83	35.44	38.27	42.69	
07	175 HP 4WD Tractor	1,598.7	4.84	0.23	0.31	3.44	41.35	44.79	50.18	
07	200 HP 4WD Tractor	1,586.2	5.92	0.28	0.38	4.18	47.25	51.43	58.02	
07	225 HP 4WD Tractor	1,596.4	6.30	0.30	0.41	4.48	53.16	57.64	64.65	
07	75 HP 4WD Tractor	1,598.8	1.47	0.07	0.09	1.05	14.99	16.04	17.67	
07	ATV	283.0	1.19	0.04	0.06	0.25	4.11	4.36	5.66	
07	ATV	283.0	1.19	0.04	0.06	0.25	4.11	4.36	5.66	
07	Bed Shaper	198.4	4.06	0.16	0.22	2.63	0.00	2.63	7.07	
07	Chisel - 20'	199.3	8.67	0.34	0.46	5.59	0.00	5.59	15.07	
07	Cultivator - Sled	198.4	1.52	0.06	0.08	0.99	0.00	0.99	2.65	
07	Digger - 2 Row Potato	266.2	30.84	0.57	0.77	24.64	47.25	71.89	104.08	
07	Disc - Stubble 15'	198.3	6.42	0.25	0.34	3.20	0.00	3.20	10.22	
07	Elevator	193.6	17.23	0.68	0.92	6.94	0.00	6.94	25.77	
07	Holding Tub	193.6	21.93	0.87	1.17	8.83	0.00	8.83	32.80	
07	Mower - Flail - 15	198.0	8.58	0.34	0.46	10.89	0.00	10.89	20.26	
07	Pickup 1/2 Ton	283.0	6.36	0.24	0.32	1.36	10.26	11.62	18.54	
07	Pickup 1/2 Ton	283.0	6.36	0.24	0.32	1.36	10.26	11.62	18.54	
07	Pickup 1/2 Ton	283.0	6.36	0.24	0.32	1.36	10.26	11.62	18.54	
07	Pickup 1/2 Ton	283.0	6.36	0.24	0.32	1.36	10.26	11.62	18.54	
07	Pickup 3/4 Ton	283.0	7.58	0.28	0.38	1.62	12.32	13.94	22.19	
07	Pickup 3/4 Ton	283.0	7.58	0.28	0.38	1.62	12.32	13.94	22.19	
07	Planter - 4 Row Potato	60.5	55.14	2.18	2.94	14.02	0.00	14.02	74.27	
07	Potato Truck - 20' Bed	121.0	10.51	0.50	0.68	1.69	24.43	26.12	37.81	
07	Potato Truck - 20' Bed	121.0	10.51	0.50	0.68	1.69	24.43	26.12	37.81	
07	Potato Truck - 20' Bed	121.0	10.51	0.50	0.68	1.69	24.43	26.12	37.81	
07	Potato Truck - 20' Bed	121.0	10.51	0.50	0.68	1.69	24.43	26.12	37.81	
07	Ripper - 14'	198.5	8.86	0.35	0.47	6.09	0.00	6.09	15.78	
07	Roller - Flat -15'	199.1	2.28	0.09	0.12	0.79	0.00	0.79	3.29	
07	Rotospike - 15"	148.3	11.86	0.47	0.63	8.02	0.00	8.02	20.99	
07	Windrower - Potato	161.3	18.80	0.74	1.00	18.70	0.00	18.70	39.24	

Table 6.

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

COSTS PER ACRE AT VARYING YIELD TO PRODUCE CHIPPER POTATOES FOR PROCESSING							
	YIELD (CWT/ACRE)						
	350	400	450	500	550	600	650
OPERATING COSTS/ACRE:							
Preplant Cost	594	594	594	594	594	594	594
Cultural Cost	1,141	1,141	1,141	1,141	1,141	1,141	1,141
Pre-harvest Cost	55	55	55	55	55	55	55
Harvest Cost	616	674	732	790	848	906	965
Interest on Operating Capital	61	61	62	62	62	63	63
TOTAL OPERATING COSTS/ACRE	2,467	2,526	2,584	2,643	2,701	2,760	2,818
TOTAL OPERATING COSTS/TON	7.05	6.31	5.74	5.29	4.91	4.60	4.34
CASH OVERHEAD COSTS/ACRE	567	567	567	567	567	567	567
TOTAL CASH COSTS/ACRE	3,034	3,092	3,151	3,209	3,268	3,326	3,385
TOTAL CASH COSTS/TON	8.67	7.73	7.00	6.42	5.94	5.54	5.21
NON-CASH OVERHEAD COSTS/ACRE	318	318	318	319	319	319	319
TOTAL COSTS/ACRE	3,352	3,410	3,469	3,528	3,586	3,645	3,704
TOTAL COSTS/TON	9.58	8.53	7.71	7.06	6.52	6.08	5.70

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR CHIPPER POTATOES FOR PROCESSING

PRICE (DOLLARS/CWT)	YIELD (CWT/ACRE)						
	350	400	450	500	550	600	650
Chippers for Processing							
6.25	-280	-26	228	482	736	990	1,245
6.75	-105	174	453	732	1,011	1,290	1,570
7.25	70	374	678	982	1,286	1,590	1,895
7.75	245	574	903	1,232	1,561	1,890	2,220
8.25	420	774	1,128	1,482	1,836	2,190	2,545
8.75	595	974	1,353	1,732	2,111	2,490	2,870
9.25	770	1,174	1,578	1,982	2,386	2,790	3,195

NET RETURNS PER ACRE ABOVE CASH COSTS FOR CHIPPER POTATOES FOR PROCESSING

PRICE (DOLLARS/CWT)	YIELD (CWT/ACRE)						
	350	400	450	500	550	600	650
Chippers for Processing							
6.25	-846	-592	-338	-84	170	424	678
6.75	-671	-392	-113	166	445	724	1,003
7.25	-496	-192	112	416	720	1,024	1,328
7.75	-321	8	337	666	995	1,324	1,653
8.25	-146	208	562	916	1,270	1,624	1,978
8.75	29	408	787	1,166	1,545	1,924	2,303
9.25	204	608	1,012	1,416	1,820	2,224	2,628

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR CHIPPER POTATOES FOR PROCESSING

PRICE (DOLLARS/CWT)	YIELD (CWT/ACRE)						
	350	400	450	500	550	600	650
Chippers for Processing							
6.25	-1,164	-910	-657	-403	-149	105	359
6.75	-989	-710	-432	-153	126	405	684
7.25	-814	-510	-207	97	401	705	1,009
7.75	-639	-310	18	347	676	1,005	1,334
8.25	-464	-110	243	597	951	1,305	1,659
8.75	-289	90	468	847	1,226	1,605	1,984
9.25	-114	290	693	1,097	1,501	1,905	2,309

Table 7.

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

COSTS AND RETURNS - PER ACRE BASIS

	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)
Crop							
Chippers for Processing	3,875	2,643	1,232	3,209	666	3,528	347

COSTS AND RETURNS - TOTAL ACREAGE

	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)
Crop							
Chippers for Processing	937,750	639,500	298,250	776,630	161,120	853,733	84,017

BREAKEVEN PRICES PER YIELD UNIT

	Base Yield (Units/Acre)	Yield Units	----- Breakeven Price To Cover -----		
			Operating Costs	Cash Costs	Total Costs
CROP					
			----- \$ per Yield Unit -----		
Chippers for Processing	500.0	Cwt	5.29	6.42	7.06

BREAKEVEN YIELDS PER ACRE

	Yield Units	Base Price (\$/Unit)	----- Breakeven Yield To Cover -----		
			Operating Costs	Cash Costs	Total Costs
CROP					
			----- Yield Units / Acre -----		
Chippers for Processing	Cwt	7.75	341.0	414.1	455.2

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

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	100.00	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
Weed Control & Irrigate	June	Labor		Matrix DF	1.50	FIOz
				Water	1.38	AcIn
Disease Control & Irrigate	June	Labor		Water	1.75	AcIn
- Ridomil Gold Bravo'				Ridomil Gold Bravo	1.80	Lbs
Insect Control - Monitor on 90% of Acres	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 Bravo on 90% of Acres				Ridomil Gold 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 25% of Acres	August	Air Application		Royal MH-30	0.31	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
Treat for Fusarium (Storage) - - on 80% of Yield	October	Labor		Mertect 340-F	400.00	Cwt
Store Potatoes in Shed	October	Contract			500.00	Cwt
Treat For Sprouts on 50% of Yield	October	Labor		Sprout Inhibitor	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)				