Southcentral Idaho: Magic Valley
Russet Burbank Potatoes With Fumigation: Production and Storage Costs

Magic Valley

Paul E. Patterson

Background and Assumptions

The University of Idaho's costs and returns estimates are based on economic costs, not accounting costs. All resources are valued at a market rate or "opportunity cost". Input prices are based on the data collected annually by the University of Idaho from agricultural supply companies. The selling price for the commodity is typically an historical average price, not a current year's projected price. The cost estimate shown here is typical for growing Russet Burbank potatoes with fumigation under irrigation in southcentral Idaho's Magic Valley. The costs shown in Tables 1 – 6 include the costs to grow, harvest and sort potatoes. The total cost per cwt shown at the bottom of Table 1 is the cost to the end of the piler boom. Transportation costs to a processor or fresh pack facility are not included. Storage costs are shown in Table 7.

Production practices are based on data from potato growers in Cassia, Minidoka, Jerome, Gooding, and Twin Falls counties, crop consultants and extension personnel in southcentral Idaho. Production practices depicted in this publication are not University of Idaho recommendations. Although production practices may be similar for individual farms, each farm has a unique set of resources with different levels of productivity, different production problems, and therefore different costs. Farm size, crop rotation, age and type of equipment, and the quality and intensity of management are all crucial factors that influence costs.

The Model Farm

This costs and returns estimate models a 2,200-acre farm with 550 acres in potatoes, 550 acres in sugarbeets, 550 acres in wheat or barley, 150 acres in dry beans, and 400 acres in corn or alfalfa.

The farm uses a center pivot irrigation system and surface water delivered to the farm from an irrigation district. The irrigation district charges a flat fee per acre for water. Irrigation power use is based only on pressurization (no lift). Power costs per acre-inch of water applied are calculated using 2015 Idaho Power Schedule 24 Agricultural Irrigation Service rates. Power costs per acre-inch for water pumped from different depths and for different irrigation systems is included in Idaho's annual *Input Crop Input Cost Summary* located at

http://www.uidaho.edu/cals/idaho-agbiz/crop-enterprise-budgets

Production Practices

After the straw from the preceding grain crop is removed, the potato ground is watered, disked, deep-ripped and then fumigated. In the spring the ground is marked-out for planting. Potatoes are planted in late April using one 6-row planter with 36-inch row spacing. The seeding rate is 23 hundredweight (cwt). Potatoes are cultivated and hilled once in May with a basin tillage tool. In September, vines are sprayed with a desiccant. Vines are also rolled and beat. Potato harvest begins three weeks later using a 4-row harvester, 4-row windrower, and six 10-wheeler trucks (300-cwt capacity). Potatoes are hauled from the field to a central location where they are sorted before being transferred to a semi-trailer for transport to a processor or fresh pack shed; or placed into on-farm grower owned storage. The costs associated with this second option are shown in Table 7. Prior to this year, the University of Idaho published separate storage and non-storage costs and returns estimates for potatoes.

Most fertilizer is split-applied by a custom applicator in two pre-plant applications, fall and spring. A liquid starter fertilizer with nitrogen, phosphate and micronutrients is applied at row mark-out. Additional nitrogen is applied during the growing season through the irrigation system. The weed control program uses cultural, mechanical (tillage and cultivation), and chemical control methods. A 3-way herbicide tank mix is ground applied in May. Disease and insect pressure were both high in 2015, resulting in more foliar applications of both fungicides and insecticides. For insect control, a systemic insecticide is applied in-furrow at planting. Seven foliar insecticides are applied by air throughout the growing season. Eight fungicide applications are made to control a number of different diseases. One fungicide is soil applied at planting, and seven foliar fungicides applications are made by air from late June through August. Fungicides are often tank-mixed with an insecticide. The seed treatment also contains a fungicide.

Potatoes receive 27 inches of water during the growing season, 1.0 inch in May, 7 inches in June, 10 inches in July, and 9 inches in August. One inch of water is applied pre-harvest in September, and 2.0 inches applied to the grain stubble the previous fall is also credited to potatoes, for a total of 30 inches.

Machinery

Machinery and equipment used to produce potatoes is shown in Tables 4 and 5. Equipment used in sorting or handling potatoes is not included. The repair and ownership costs for this equipment is, however, shown in Tables 1 and 2. Table 4 lists the field equipment and their hourly operating and ownership costs, while Table 5 lists the equipment and their annual ownership costs.

Machinery ownership capital recovery cost is based on 75% of the replacement cost of a new piece of equipment, except for trucks. Truck prices are for a used vehicle with a new self-unloading bed. Capital recovery combines depreciation and interest into a single value. To keep machinery prices current between years in which a comprehensive survey is conducted, machinery prices are adjusted using USDA's Farm Machinery Prices Paid Index. Equipment prices are collected approximately every five years.

Labor and Management

The cost of labor used in this study includes a base wage rate, plus a percentage to account for various payroll taxes (FICA, SUTA & FUTA), and workman's compensation, as well as benefits such as paid vacation/personal leave days, health insurance and bonuses. Labor is classified by the type of work performed. Labor classifications, labor rates and payroll overhead are shown below.

Labor Values

Labor Class	Base Rate	Payroll Overhead	Effective Rate
General Farm Labor	$9.25	15%	$10.65
Truck Drivers	$12.50	15%	$14.40
Equipment Operators	$14.80	25%	$18.50
Irrigation Labor			
Set Move: HL & WL	$10.10	30%	$13.15
Continuous Move: CP & L	$14.80	25%	$18.50

Set Move includes: handlines and wheellines
Continuous Move includes: center pivots and linear move
Payroll overhead for set move systems includes housing

Equipment operator labor is calculated at 1.2 times machinery use hours. Machinery hours are calculated for all field operations, except those performed by a custom operator. Custom operations are listed separately. Machinery hours are based on a standard engineering equation using: speed x width x overall field efficiency. General farm labor accounts for extra field labor used primarily during planting or harvest.

A management fee based of approximately 5% of the total production costs is also included. Prior to 2013, the basis of the 5% charge was expected revenue.

Capital, Land and Overhead Costs

Interest on operating capital is charged from the time an input is applied until harvest and is calculated at a nominal rate of 5.75 percent. Interest on intermediate term capital, primarily equipment, is calculated using a nominal rate of 5.5 percent. A general overhead charge, calculated at approximately 2.5 percent of operating expenses, is included to cover unallocated whole-farm costs such as office expenses, legal and accounting fees, cell phones, internet service and utilities. Irrigation power is shown as a separate cost item and is not included as part of general farm utilities. Fees paid by the grower, listed under other operating costs, include: promotion fees paid to the Idaho Potato Commission and the National Potato Board, inspection fees paid to the Idaho Department of Agriculture, and membership fees paid to grower organizations. The consultant fee, listed under custom operating costs, includes soil and petiole sampling and irrigation scheduling.

Land rent is based on a one-year cash lease for potatoes and covers the ownership costs (depreciation, interest, and insurance) of the irrigation system. Since the charge for water, irrigation system repairs and irrigation power costs are listed separately, the land rent may appear low because the land owner in many circumstances pays some or even all these expenses.

Budget Format

In addition to the Background and Assumption page, this publication has seven tables presenting a variety of cost and returns information. Production costs in Tables 1-6 include only the base cost to grow, harvest and sort potatoes. Table 7 shows the additional costs incurred when potatoes are placed in on-farm storage. Table 7 includes the annual repair and ownership costs, as well as monthly storage operating costs. Table 7 has two columns. The first column shows cost per hundredweight based on the field-run yield shown in Table 1, while the second column shows the cost per hundredweight based on an assumed paid yield of 95% of field-run. The paid yield percentage will vary by quality and grade, and whether the potatoes go to the fresh or process markets.

Table 1 shows both expected revenue, based a specified yield and price, and expenses. Expenses are broken into two main categories: operating and ownership. Operating expenses are those that typically vary with the level of production and involve inputs that are used in a single production cycle. Ownership expenses include a systematic cost recovery over the useful life for inputs used in the production process that have a useful life of more than one year. Machinery and land costs fall into this category. Operating inputs are organized by category. In addition to the cost per unit and cost per acre for each input, a total cost is given for each category. Table 1 also gives a total of all operating, ownership and total costs per acre, as well as these same cost categories per cwt based on a field-run yield basis.

Table 2 has most of the same cost information presented in Table 1 but the data is organized by operation for both pre-harvest and harvest costs. Operations can define a single activity, such as seed hauling, or multiple activities as in the case of tillage.

The quantity of labor is shown for each operation. The cash costs per acre for labor, machinery costs, materials and custom are also specified. Cash overhead expenses are listed separately as are the non-cash overhead.

Table 3 is a monthly cash flow of expenses based on when the operation occurs and when inputs are applied. Field operations are classified as pre-harvest, harvest and post-harvest. Cash flow also includes interest charge on operating costs.

Table 4 lists tractors, field equipment, trucks and pickups used to produce this crop and the costs per hour to operate them. Total annual hours of use for the current crop and for all crops on the farm is also shown.

Table 5 lists the purchase price and salvage value of equipment used to produce this crop, as well as annual capital recover and cash overhead expenses.

Table 6 provides a ranging analysis, sometime referred to as a sensitivity analysis. Table 6 shows how the costs and returns per acre will vary as the yield and/or price ranges above and below the base values from Table 1. There are four sections to Table 6. The first summarizes the costs per acre and per hundredweight and calculates a breakeven price needed to cover all costs as the yield varies above and below the base yield. The next three sections show the returns over operating, cash, and total costs per acre, respectively.

Table 7 begins with the base production cost per hundredweight from Table 1. This includes the cost to grow, harvest and sort potatoes. It's the cost of potatoes "to the end of the piler boom". Table 7 shows the base cost of potato production on both a field-run basis from Table 1 and a paid-yield basis, assuming a 95% paid yield.

Storage ownership and repair costs per hundredweight are added to the base cost of growing, harvesting and sorting potatoes. Storage ownership costs are based on annual ownership costs (depreciation and interest) divided by the storage capacity of the storage facility, assuming 90% utilization. Ownership costs do not change based on the length of storage.

Potato storage operating costs increase based on the length of storage. Storage operating costs are calculated on a monthly basis and include: interest, shrink, sanitation chemicals, sprout inhibitor and electricity. Sorting labor is included in the base budget. Table 7 shows the cumulative storage costs per month from October through June. Storage costs are calculated to the end of the month. The cumulative cost is added to the base production cost, storage ownership cost and repair costs to give a total cost per hundredweight by month for the entire storage season.

Potatoes stored beyond June would likely need refrigeration. The cost of refrigeration was not included in the cost of the storage system used to calculate the annual storage ownership and repair costs.

University of Idaho costs and returns estimates for both crops and livestock can be found at:

http://web.cals.uidaho.edu/idahoagbiz/enterprise-budgets/

Authors
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TABLE 1. COSTS AND RETURNS PER ACRE TO PRODUCE POTATOES

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Potatoes	470.00	cwt	7.25	3,407.50	
TOTAL GROSS RETURNS	470.00	cwt		3,407.50	
OPERATING COSTS					
Seed:				**330.05**	
G-3 Russet Burbank Seed	23.00	cwt	12.65	290.95	
Potato Seed Cutting	23.00	cwt	1.70	39.10	
Fertilizer:				**489.25**	
Dry Nitrogen	175.00	lb	0.55	96.25	
Dry P2O5	220.00	lb	0.53	116.60	
K2O	235.00	lb	0.44	103.40	
Sulfur	90.00	lb	0.27	24.30	
Micronutrients - Potatoes	2.00	acre	18.00	36.00	
Liquid Nitrogen	110.00	lb	0.73	80.30	
Liquid P205	45.00	lb	0.72	32.40	
Pesticide:				**544.31**	
Metam CLR (42%)	40.00	gal	5.65	226.00	
Potato Seed Treatment	23.00	cwt	0.50	11.50	
Admire Pro	8.00	fl oz	1.50	12.00	
Quadris Flowable	8.00	fl oz	2.30	18.40	
Outlook 6EC	20.00	fl oz	1.02	20.40	
Prowl 3.3EC	2.00	pint	4.90	9.80	
Metribuzin 75DF	0.75	lb	14.65	10.99	
Brigadier	18.00	fl oz	1.35	24.30	
Endura	5.50	oz	4.70	25.85	
Dithane F45 Rainshield	5.60	qt	8.70	48.72	
Agri-Mek .75SC	10.50	fl oz	2.60	27.30	
Tanos DF	6.00	oz	2.75	16.51	
Movento	5.00	fl oz	7.50	37.50	
Gavel 75DF	2.00	lb	7.75	15.50	
Revus Top	7.00	fl oz	2.42	16.94	
Reglone	1.00	qt	22.60	22.60	
Custom:				**157.25**	
Custom Fumigate - Deep Injection	1.00	acre	44.00	44.00	
Custom Fertilize: 400 - 800 lbs	1.00	acre	7.75	7.75	
Custom Fertilize: 0 - 400 lbs	1.00	acre	7.25	7.25	
Custom Air Spray - 7.5 gallon	7.00	acre	9.75	68.25	
Consultant Soil/Pet. Testing	1.00	acre	30.00	30.00	
Irrigation:				**117.90**	
Irrigation Power - CP	30.00	ac-in	1.90	57.00	
Water Assessment	1.00	acre	45.60	45.60	
Irrigation Repairs - CP	30.00	ac-in	0.51	15.30	
Other:				**150.28**	
Crop Insurance	1.00	acre	70.00	70.00	
Potato Fees & Assessments	446.00	cwt	0.18	80.28	
Potato Sorting:				**66.55**	
Sorting Labor	470.00	cwt	0.11	50.57	
Sorting Equip. Repairs & Power	470.00	cwt	0.03	15.98	
Labor				**178.03**	
Equipment Operator Labor	4.52	hrs	18.50	83.67	
Truck Driver Labor	2.00	hrs	14.40	28.80	
Irrigation Labor: CP	1.20	hrs	18.50	22.20	
General Farm Labor	2.26	hrs	10.65	24.12	
Irrigation Labor: Chem-Fert	1.04	hrs	18.50	19.24	
Machinery				**125.11**	
Fuel-Gas	4.59	gal	2.50	11.49	
Fuel-Diesel	19.41	gal	2.30	44.65	
Fuel-Road Diesel	2.28	gal	2.85	6.50	
Lube				9.39	
Machinery Repair				53.08	
Interest on Operating Capital @ 5.75%				73.31	
TOTAL OPERATING COSTS/ACRE				2,232.04	
TOTAL OPERATING COSTS/CWT				4.75	
NET RETURNS ABOVE OPERATING COSTS				1,175.46	

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TABLE 1. CONTINUED

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
CASH OVERHEAD COSTS					
General Overhead				47.00	
Land Rent				625.00	
Management Fee				138.00	
Potato Handling Equip. - D&I				69.00	
Property Taxes				0.00	
Property Insurance				5.56	
Investment Repairs				0.00	
TOTAL CASH OVERHEAD COSTS/ACRE				884.56	
TOTAL CASH OVERHEAD COSTS/CWT				1.88	
TOTAL CASH COSTS/ACRE				3,116.61	
TOTAL CASH COSTS/CWT				6.63	
NET RETURNS ABOVE CASH COSTS				290.89	
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Equipment				188.10	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				188.10	
TOTAL NON-CASH OVERHEAD COSTS/CWT				0.40	
TOTAL COST/ACRE				3,304.71	
TOTAL COST/CWT				7.03	
NET RETURNS ABOVE TOTAL COST				102.29	

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TABLE 2. COSTS PER ACRE TO PRODUCE POTATOES

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per Acre						
		Labor Cost	Fuel	Lube &Repairs	Material Cost	Custom/ Rent	Total Cost	Your Cost
Preharvest:								
Irrigation	0.00	22.20	0.00	0.00	57.00	0.00	79.20	
Tillage	0.25	8.86	7.43	7.41	0.00	0.00	23.70	
Fumigation	0.00	0.00	0.00	0.00	226.00	44.00	270.00	
Applying Fertilizer	0.00	0.00	0.00	0.00	358.55	15.00	373.55	
Crop Insurance	0.00	0.00	0.00	0.00	70.00	0.00	70.00	
Irrigation Water Assessment	0.00	0.00	0.00	0.00	45.60	0.00	45.60	
Irrigation System Repairs	0.00	0.00	0.00	0.00	15.30	0.00	15.30	
Mark Out and Fertilize	0.06	2.23	1.59	1.12	65.00	0.00	69.94	
Seed Hauling	0.09	2.00	0.23	0.32	0.00	0.00	2.55	
Planting	0.24	11.23	5.88	9.77	371.95	0.00	398.83	
Hilling - Cultivation	0.11	4.01	2.86	1.83	0.00	0.00	8.70	
Applying Pesticides	0.07	2.47	1.41	0.70	253.81	68.25	326.63	
Chemigation - Fertigation	0.00	19.24	0.00	0.00	65.70	0.00	84.94	
Consultant	0.00	0.00	0.00	0.00	0.00	30.00	30.00	
General Pickup Use	1.36	30.19	11.32	4.46	0.00	0.00	45.97	
4 Wheeler Use	0.20	4.44	0.17	0.25	0.00	0.00	4.85	
Service Truck Use	0.04	0.97	0.31	0.13	0.00	0.00	1.41	
Fuel Truck Use	0.04	0.97	0.31	0.14	0.00	0.00	1.43	
TOTAL PREHARVEST COSTS	2.47	108.80	31.50	26.13	1,528.91	157.25	1,852.59	
Harvest :								
Applying Pesticides	0.07	2.47	1.41	0.70	22.60	0.00	27.17	
Beat-Roll Vines	0.19	6.54	4.67	3.77	0.00	0.00	14.98	
Digging	0.51	17.80	14.58	19.27	0.00	0.00	51.65	
Crop Hauling	2.00	36.20	5.13	7.18	0.00	0.00	48.51	
Potato Sorting	0.00	0.00	0.00	0.00	66.55	0.00	66.55	
Dump Truck Use	0.05	1.01	0.52	0.12	0.00	0.00	1.64	
TOTAL HARVEST COSTS	2.81	64.01	26.31	31.04	89.15	0.00	210.51	
Post Harvest:								
Tillage	0.15	5.22	4.83	5.31	0.00	0.00	15.36	
Promotion Fees & Assessments	0.00	0.00	0.00	0.00	80.28	0.00	80.28	
TOTAL POST HARVEST COSTS	0.15	5.22	4.83	5.31	80.28	0.00	95.64	
Interest on Operating Capital at 5.75%							73.31	
TOTAL OPERATING COSTS/ACRE	5.44	178.03	62.63	62.48	1,698.34	157.25	2,232.04	

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TABLE 2. CONTINUED

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per Acre Labor Cost	Fuel	Lube &Repairs	Material Cost	Custom/ Rent	Total Cost	Your Cost
CASH OVERHEAD:								
General Overhead							47.00	
Land Rent							625.00	
Management Fee							138.00	
Potato Handling Equip. - D&I							69.00	
Property Taxes							0.00	
Property Insurance							5.56	
Investment Repairs							0.00	
TOTAL CASH OVERHEAD COSTS/ACRE							884.56	
TOTAL CASH COSTS/ACRE							3,116.61	
NON-CASH OVERHEAD:		Per Producing Acre		Annual Cost Capital Recovery				
Equipment		1,989.00		188.10			188.10	
TOTAL NON-CASH OVERHEAD COSTS		1,989.00		188.10			188.10	
TOTAL COSTS/ACRE							3,304.71	

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TABLE 3. MONTHLY COSTS PER ACRE TO PRODUCE POTATOES

	SEP 14	OCT 14	NOV 14	DEC 14	JAN 15	FEB 15	MAR 15	APR 15	MAY 15	JUN 15	JUL 15	AUG 15	SEP 15	OCT 15	Total
Preharvest:															
Irrigation	5.28								2.64	18.48	26.40	23.76	2.64		79.20
Tillage		23.70													23.70
Fumigation		270.00													270.00
Applying Fertilizer		228.40					145.15								373.55
Crop Insurance								70.00							70.00
Irrigation Water Assessment								45.60							45.60
Irrigation System Repairs								15.30							15.30
Mark Out and Fertilize								69.94							69.94
Seed Hauling								2.55							2.55
Planting								398.83							398.83
Hilling - Cultivation									8.70						8.70
Applying Pesticides									45.76	75.47	75.09	130.31			326.63
Chemigation - Fertigation										27.08	29.30	28.56			84.94
Consultant											30.00				30.00
General Pickup Use	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	45.97
4 Wheeler Use	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	4.85
Service Truck Use	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	1.41
Fuel Truck Use	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	1.43
TOTAL PREHARVEST COSTS	9.11	525.93	3.83	3.83	3.83	3.83	148.98	606.05	60.93	124.86	164.62	186.46	6.47	3.83	1,852.59
Harvest :															
Applying Pesticides													27.17		27.17
Beat-Roll Vines													14.98		14.98
Digging													51.65		51.65
Crop Hauling													48.51		48.51
Potato Sorting													66.55		66.55
Dump Truck Use														1.64	1.64
TOTAL HARVEST COSTS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	208.86	1.64	210.51
Post Harvest:															
Tillage														15.36	15.36
Promotion Fees & Assessments														80.28	80.28
TOTAL POST HARVEST COSTS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	95.64	95.64
Interest on Operating Capital @5.75%	0.04	2.56	2.58	2.60	2.62	2.64	3.35	6.26	6.55	7.15	7.93	8.83	9.86	10.34	73.31
TOTAL OPERATING COSTS/ACRE	9.16	528.50	6.41	6.43	6.45	6.47	152.33	612.31	67.48	132.01	172.56	195.29	225.20	111.46	2,232.04
CASH OVERHEAD															
General Overhead	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	47.00
Land Rent							625.00								625.00
Management Fee	9.86	9.86	9.86	9.86	9.86	9.86	9.86	9.86	9.86	9.86	9.86	9.86	9.86	9.86	138.00
Potato Handling Equip. - D&I														69.00	69.00
Property Taxes															0.00

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TABLE 3. CONTINUED

	SEP 14	OCT 14	NOV 14	DEC 14	JAN 15	FEB 15	MAR 15	APR 15	MAY 15	JUN 15	JUL 15	AUG 15	SEP 15	OCT 15	Total
Property Insurance								5.56							5.56
Investment Repairs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL CASH OVERHEAD COSTS	13.21	13.21	13.21	13.21	13.21	13.21	638.21	18.78	13.21	13.21	13.21	13.21	13.21	82.21	884.56
TOTAL CASH COSTS/ACRE	22.37	541.71	19.63	19.65	19.67	19.68	790.55	631.08	80.69	145.22	185.77	208.50	238.41	193.67	3,116.61

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TABLE 4. HOURLY EQUIPMENT COSTS

Yr	Description	Potatoes Hours Used	Total Hours Used	Capital Recovery	Cash Overhead Insur-ance	Cash Overhead Taxes	Operating Lube& Repairs	Operating Fuel	Operating Total Oper.	Total Costs/Hr.
15	Disk-Ripper 13'	164	165	26.41	0.70	0.00	18.44	0.00	18.44	45.54
15	Pickup 1 - 3/4 ton	226	750	8.57	0.16	0.00	3.28	8.32	11.60	20.33
15	Pickup 2 - 3/4 ton	226	750	8.57	0.16	0.00	3.28	8.32	11.60	20.33
15	Tandem Disk - 18'	57	150	21.30	0.56	0.00	7.40	0.00	7.40	29.26
15	Tractor - 160hp	85	350	26.95	0.95	0.00	7.49	18.17	25.66	53.56
15	Tractor - 200hp	286	500	22.61	0.80	0.00	11.57	22.70	34.27	57.67
15	Tractor - 250hp	335	500	30.96	1.09	0.00	15.59	29.39	44.98	77.03
15	Truck 2P 10-Wheeler	192	370	19.06	0.60	0.00	4.66	2.57	7.22	26.88
15	Truck 3P 10-Wheeler	192	370	19.06	0.60	0.00	4.66	2.57	7.22	26.88
15	Truck 1P 10-Wheeler	192	370	19.06	0.60	0.00	2.52	2.57	5.09	24.75
15	Truck 4P 10-Wheeler	192	370	19.06	0.60	0.00	2.52	2.57	5.09	24.75
15	Truck 5P 10-Wheeler	192	370	19.06	0.60	0.00	2.52	2.57	5.09	24.75
15	Sprayer - 30'	78	150	2.93	0.07	0.00	1.65	0.00	1.65	4.65
15	Markout Bar 12-Row	35	50	46.47	1.23	0.00	1.75	0.00	1.75	49.46
15	Basin Tillage Tool 6-Row 36"	63	65	33.79	0.97	0.00	3.24	0.00	3.24	38.00
15	Service Truck	24	80	36.69	1.21	0.00	2.87	7.13	9.99	47.89
15	Truck 6P 10-Wheeler	192	300	23.50	0.74	0.00	4.66	2.57	7.22	31.47
15	Potato Harvester 4-Row	140	150	99.40	2.63	0.00	31.53	0.00	31.53	133.56
15	Potato Windrow - 4-Row	140	150	45.18	1.20	0.00	14.33	0.00	14.33	60.71
15	Potato Vine Beater-Roller	103	105	46.16	1.05	0.00	7.45	0.00	7.45	54.66
15	Pickup 3 - 3/4 ton	99	325	11.91	0.34	0.00	3.28	8.32	11.60	23.85
15	Pickup 4 - 3/4 ton	99	325	11.91	0.34	0.00	3.28	8.32	11.60	23.85
15	Pickup 5 - 3/4 ton	99	325	11.91	0.34	0.00	3.28	8.32	11.60	23.85
15	4-Wheeler #2	55	150	3.95	0.12	0.00	1.23	0.83	2.06	6.13
15	4-Wheeler #1	55	150	3.95	0.12	0.00	1.23	0.83	2.06	6.13
15	Fuel Truck	24	80	46.10	1.49	0.00	3.32	7.13	10.44	58.04
15	Dump Truck	25	25	58.18	1.98	0.00	2.61	11.40	14.01	74.17
15	Tractor 2 -200hp	294	500	22.61	0.80	0.00	11.57	22.70	34.27	57.67
15	Tank/injector - 36'	35	50	25.74	0.74	0.00	3.14	0.00	3.14	29.62
15	Planter - 6R PO	129	130	57.64	1.43	0.00	24.39	0.00	24.39	83.45
15	Planter Filler	129	130	5.96	0.16	0.00	4.42	0.00	4.42	10.54

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

ANNUAL EQUIPMENT COSTS

						Cash Overhead		
Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur-ance	Taxes	Total
15	Disk-Ripper 13'	45,000.00	12	6,232.80	4,840.93	128.08	0.00	4,969.01
15	Pickup 1 - 3/4 ton	41,000.00	5	13,750.00	7,137.56	136.88	0.00	7,274.43
15	Pickup 2 - 3/4 ton	41,000.00	5	13,750.00	7,137.56	136.88	0.00	7,274.43
15	Tandem Disk - 18'	33,000.00	12	4,570.72	3,550.02	93.93	0.00	3,643.94
15	Tractor - 160hp	131,000.00	20	16,808.81	10,479.93	369.52	0.00	10,849.45
15	Tractor - 200hp	157,000.00	20	20,144.91	12,559.91	442.86	0.00	13,002.77
15	Tractor - 250hp	215,000.00	20	27,586.97	17,199.88	606.47	0.00	17,806.35
15	Truck 2P 10-Wheeler	95,000.00	20	4,000.00	7,834.82	247.50	0.00	8,082.32
15	Truck 3P 10-Wheeler	95,000.00	20	4,000.00	7,834.82	247.50	0.00	8,082.32
15	Truck 1P 10-Wheeler	95,000.00	20	4,000.00	7,834.82	247.50	0.00	8,082.32
15	Truck 4P 10-Wheeler	95,000.00	20	4,000.00	7,834.82	247.50	0.00	8,082.32
15	Truck 5P 10-Wheeler	95,000.00	20	4,000.00	7,834.82	247.50	0.00	8,082.32
15	Sprayer - 30'	4,100.00	10	725.05	487.62	12.06	0.00	499.69
15	Markout Bar 12-Row	24,000.00	12	3,324.16	2,581.83	68.31	0.00	2,650.14
15	Basin Tillage Tool 6-Row 36"	25,600.00	15	2,457.76	2,440.74	70.14	0.00	2,510.88
15	Service Truck	40,000.00	20	3,000.00	3,261.14	107.50	0.00	3,368.64
15	Truck 6P 10-Wheeler	95,000.00	20	4,000.00	7,834.82	247.50	0.00	8,082.32
15	Potato Harvester 4-Row	154,000.00	12	21,330.02	16,566.75	438.33	0.00	17,005.07
15	Potato Windrow - 4-Row	70,000.00	12	9,695.46	7,530.34	199.24	0.00	7,729.58
15	Potato Vine Beater-Roller	40,000.00	8	9,031.45	5,385.55	122.58	0.00	5,508.13
15	Pickup 3 - 3/4 ton	41,000.00	12	7,500.00	4,299.48	121.25	0.00	4,420.73
15	Pickup 4 - 3/4 ton	41,000.00	12	7,500.00	4,299.48	121.25	0.00	4,420.73
15	Pickup 5 - 3/4 ton	41,000.00	12	7,500.00	4,299.48	121.25	0.00	4,420.73
15	4-Wheeler #2	6,000.00	10	1,772.31	658.36	19.43	0.00	677.79
15	4-Wheeler #1	6,000.00	10	1,772.31	658.36	19.43	0.00	677.79
15	Fuel Truck	50,000.00	20	3,000.00	4,097.93	132.50	0.00	4,230.43
15	Dump Truck	20,000.00	20	2,000.00	1,616.23	55.00	0.00	1,671.23
15	Tractor 2 -200hp	157,000.00	20	20,144.91	12,559.91	442.86	0.00	13,002.77
15	Tank/injector - 36'	15,000.00	15	1,440.10	1,430.12	41.10	0.00	1,471.22
15	Planter - 6R PO	70,000.00	10	12,378.90	8,325.30	205.95	0.00	8,531.25
15	Planter Filler	8,000.00	12	1,108.05	860.61	22.77	0.00	883.38
	TOTAL	2,045,700.00	-	242,524.66	191,273.91	5,720.56	0.00	196,994.47
	90% of New Cost*	1,841,130.00	-	218,272.20	172,146.52	5,148.51	0.00	177,295.03

*Used to reflect a mix of new and used equipment

ANNUAL INVESTMENT COSTS

					Cash Overhead			
Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur-ance	Taxes	Repairs	Total
INVESTMENT								
TOTAL INVESTMENT	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
General Overhead	550	acre	47.00	25,850.00
Land Rent	550	acre	625	343,750.00
Management Fee	550	acre	138	75,900.00
Potato Handling Equip. - D&I	550	acre	69.00	37,950.00

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TABLE 6. RANGING ANALYSIS - POTATOES

COSTS PER ACRE AND PER CWT AT VARYING YIELDS TO PRODUCE POTATOES

	YIELD(CWT)						
	455.00	460.00	465.00	470.00	475.00	480.00	485.00
OPERATING COSTS/ACRE:							
Preharvest	1,852.59	1,852.59	1,852.59	1,852.59	1,852.59	1,852.59	1,852.59
Harvest	207.95	208.98	210.02	210.51	212.08	213.11	214.14
Post Harvest	95.64	95.64	95.64	95.64	95.64	95.64	95.64
Interest on Operating Capital @ 5.75%	73.31	73.31	73.31	73.31	73.31	73.31	73.31
TOTAL OPERATING COSTS/ACRE	2,229.49	2,230.52	2,231.55	2,232.04	2,233.62	2,234.65	2,235.68
TOTAL OPERATING COSTS/CWT	4.90	4.85	4.80	4.75	4.70	4.66	4.61
CASH OVERHEAD COSTS/ACRE	884.56	884.56	884.56	884.56	884.56	884.56	884.56
TOTAL CASH COSTS/ACRE	3,114.05	3,115.09	3,116.12	3,116.61	3,118.18	3,119.21	3,120.24
TOTAL CASH COSTS/CWT	6.84	6.77	6.70	6.63	6.56	6.50	6.43
NON-CASH OVERHEAD COSTS/ACRE	188.10	188.10	188.10	188.10	188.10	188.10	188.10
TOTAL COSTS/ACRE	3,302.15	3,303.19	3,304.22	3,304.71	3,306.28	3,307.31	3,308.34
TOTAL COSTS/CWT	7.26	7.18	7.11	7.03	6.96	6.89	6.82

Net Return Per Acre Above Operating Costs For Potatoes

PRICE ($/cwt)	YIELD (cwt/acre)						
Potatoes	455.00	460.00	465.00	470.00	475.00	480.00	485.00
6.25	614.26	644.48	674.70	705.46	735.13	765.35	795.57
6.50	728.01	759.48	790.95	822.96	853.88	885.35	916.82
6.75	841.76	874.48	907.20	940.46	972.63	1,005.35	1,038.07
7.00	955.51	989.48	1,023.45	1,057.96	1,091.38	1,125.35	1,159.32
7.25	1,069.26	1,104.48	1,139.70	1,175.46	1,210.13	1,245.35	1,280.57
7.50	1,183.01	1,219.48	1,255.95	1,292.96	1,328.88	1,365.35	1,401.82
7.75	1,296.76	1,334.48	1,372.20	1,410.46	1,447.63	1,485.35	1,523.07

Net Return Per Acre Above Cash Costs For Potatoes

PRICE ($/cwt)	YIELD (cwt/acre)						
Potatoes	455.00	460.00	465.00	470.00	475.00	480.00	485.00
6.25	-270.30	-240.09	-209.87	-179.11	-149.43	-119.21	-88.99
6.50	-156.55	-125.09	-93.62	-61.61	-30.68	0.79	32.26
6.75	-42.80	-10.09	22.63	55.89	88.07	120.79	153.51
7.00	70.95	104.91	138.88	173.39	206.82	240.79	274.76
7.25	184.70	219.91	255.13	290.89	325.57	360.79	396.01
7.50	298.45	334.91	371.38	408.39	444.32	480.79	517.26
7.75	412.20	449.91	487.63	525.89	563.07	600.79	638.51

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TABLE 6. RANGING ANALYSIS CONTINUED

Net Return Per Acre Above Total Costs For Potatoes

PRICE ($/cwt)	YIELD (cwt/acre)						
Potatoes	455.00	460.00	465.00	470.00	475.00	480.00	485.00
6.25	-458.40	-428.19	-397.97	-367.21	-337.53	-307.31	-277.09
6.50	-344.65	-313.19	-281.72	-249.71	-218.78	-187.31	-155.84
6.75	-230.90	-198.19	-165.47	-132.21	-100.03	-67.31	-34.59
7.00	-117.15	-83.19	-49.22	-14.71	18.72	52.69	86.66
7.25	-3.40	31.81	67.03	102.79	137.47	172.69	207.91
7.50	110.35	146.81	183.28	220.29	256.22	292.69	329.16
7.75	224.10	261.81	299.53	337.79	374.97	412.69	450.41

Table 7. **2015** Cost per hundredweight to grow, harvest, sort and store southcentral Idaho irrigated Russet Burbank potato with fumigation based on both field-run and paid yield.

	Storage Costs	Field Run Cost per Cwt	Paid Yield Cost per Cwt
Field-Run Yield		470	
Paid Yield %	95%		446.5
Base Cost to Grow, Harvest and Sort		**$7.03**	**$7.40**
Storage System Annual Ownership Costs	$0.357	$0.357	$0.376
Base Cost + Storage Ownership Cost		$7.39	$7.78
Storage System Annual Repairs	$0.041	$0.041	$0.043
Base + Storage System Ownership & Repairs		$7.43	$7.82

	Cumulative Storage Op. Costs	Cumulative Base + All Storage Costs	Cumulative Base + All Storage Costs
October	$0.208	$7.64	$8.04
November*	$0.376	$7.80	$8.22
December	$0.461	$7.89	$8.31
January	$0.545	$7.97	$8.39
February	**$0.630**	**$8.06**	$8.48
March	$0.714	$8.14	$8.57
April*	$0.899	$8.33	$8.77
May	$1.003	$8.43	$8.88
June	$1.124	$8.55	$9.00

Base cost of production includes cost to grow, harvest & sort potatoes,both operating and ownership. Ownership costs for potato handling equipment are included in the base cost of procution.

Storage system includes: storage facility and air system.

Storage operating costs include: repairs (shown separately), plus monthly operating costs: power, chemicals, interest, shrink & insurance.

Storage costs do not include the cost of removing the potatoes from storage.

* Indicates month when sprout inhibitor applied.

Cumulative storage operating expenses are calculated to the end of the month.