



Eastern Idaho Northern Region: Bonneville & Madison Counties Russet Burbank Potatoes: Production and Storage Costs

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 under irrigation in eastern Idaho's lower yielding northern counties. 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 pile 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 Bonneville and Madison counties, crop consultants and extension personnel in eastern 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

The model farm for this costs and returns estimate is a 2,400-acre irrigated farm with 800 acres in potatoes and 1,600 acres in grain. The typical crop rotation is one year of potatoes followed by two years of grain. Corn or an oil seed crop may substitute for grain, and alfalfa hay may be grown in longer rotations.

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 and ripped. In the spring the ground is disked and marked-out for planting. Potatoes are planted in early May using two 6-row planters with 36-inch row spacing. The seeding rate is 21 hundredweight (cwt). Potatoes are cultivated and hilled once in June with a basin tillage tool. In September, vines are rolled and sprayed with a chemical desiccant. 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 2013, 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. Two insecticide products are applied in-furrow at planting to control beetles and wire worms. Two additional foliar insecticides are applied by air during the growing season. Six fungicide applications are made to control a number of different diseases. One fungicide is applied as a seed treatment, and five foliar fungicides are applied by air or chemigation between late June and August. Foliar fungicides are often tank-mixed with an insecticide.

Potatoes receive 20 inches of water during the growing season, 1.0 inch in May, 5 inches in June, 8.0 inches in July, and 6 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 23 inches.

Machinery

Machinery and equipment used to produce potatoes is shown in Tables 4 and 5. Equipment used in sorting and 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%	\$10.40
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 wheelines

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 during planting and harvest. Irrigation labor and labor to sort potatoes are shown separately.

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

Authors

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Disclaimer

The practices and chemicals specified in the publication are not recommendations. Always read and follow the directions printed on the pesticide label. Due to constantly changing pesticide laws and labels, some pesticides may have been cancelled or had certain uses prohibited. The use of trade names for various products simplifies presentation of this material and should not be considered an endorsement, nor is any criticism implied of similar products not mentioned.

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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	360.00	cwt	7.00	2,520.00	
TOTAL GROSS RETURNS	360.00	cwt		2,520.00	
OPERATING COSTS					
Seed:				279.30	
G-3 Russet Burbank Potato Seed N	21.00	cwt	11.60	243.60	
Potato Seed Cutting	21.00	cwt	1.70	35.70	
Fertilizer:				390.90	
Dry Nitrogen - Pre-plant	145.00	lb	0.55	79.75	
Dry P2O5	155.00	lb	0.53	82.15	
K2O	180.00	lb	0.44	79.20	
Sulfur	100.00	lb	0.27	27.00	
Liquid Nitrogen	80.00	lb	0.73	58.40	
Liquid P2O5	45.00	lb	0.72	32.40	
Micronutrients & Humic Acid - CP	1.00	acre	32.00	32.00	
Pesticides/Chemicals:				238.73	
Potato Seed Treatment	21.00	cwt	0.50	10.50	
Admire Pro	8.00	fl oz	1.50	12.00	
Regent 4SC	3.20	fl oz	8.00	25.60	
Metribuzin 75DF	0.75	lb	14.65	10.99	
Outlook 6EC	18.00	fl oz	1.02	18.36	
Prowl 3.3EC	2.00	pint	4.90	9.80	
Quadris Flowable	8.00	fl oz	2.30	18.40	
Bravo ZN	2.50	pint	4.55	11.38	
Endura	5.50	oz	4.70	25.85	
Brigadier	6.00	fl oz	1.35	8.10	
Dithane F45 Rainshield	1.60	qt	8.65	13.84	
Fulfill WDG	5.50	oz	6.25	34.38	
Revus Top	7.00	fl oz	2.42	16.94	
Reglone	2.00	pint	11.30	22.60	
Custom:				67.25	
Custom Fertilize: 400 - 800 lbs	1.00	acre	7.75	7.75	
Custom Fertilize: 0 - 400 lbs	1.00	acre	7.25	7.25	
Consultants/Soil Testing - CP	1.00	acre	26.00	26.00	
Custom Air Spray - 5 gal. rate	3.00	acre	8.75	26.25	
Irrigation:				67.68	
Irrigation Power - Center Pivot	23.00	ac-in	1.90	43.70	
Irrigation Water Assessment - N	1.00	acre	12.25	12.25	
Irrigation Repairs - CP	23.00	ac-in	0.51	11.73	
Other:				131.56	
Crop Insurance	1.00	acre	70.00	70.00	
Potato Fees & Assessments	342.00	cwt	0.18	61.56	
Sorting:				50.98	
Harvest Sorting Labor - Comm.	360.00	cwt	0.11	38.74	
Sorting Equip. Repairs & Power	360.00	cwt	0.03	12.24	
Labor				156.32	
Equipment Operator Labor	4.03	hrs	18.50	74.49	
Truck Driver Labor	1.86	hrs	14.40	26.78	
Irrigation Labor - CP	0.92	hrs	18.50	17.02	
General Farm Labor	2.27	hrs	10.65	23.96	
Irrigation Labor: Chem-Fert	0.76	hrs	18.50	14.06	
Machinery				126.51	
Fuel-Gas	4.51	gal	2.50	11.27	
Fuel-Diesel	21.30	gal	2.35	50.05	
Fuel-Road Diesel	1.91	gal	2.85	5.43	
Lube				10.01	
Machinery Repair				49.75	
Interest on Operating Capital @ 5.75%				44.15	
TOTAL OPERATING COSTS/ACRE				1,553.37	
TOTAL OPERATING COSTS/CWT				4.31	
NET RETURNS ABOVE OPERATING COSTS				966.63	

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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				39.00	
Land Rent				440.00	
Management Fee				112.00	
Potato Handling Equip.- D&I				52.00	
Property Taxes				0.00	
Property Insurance				5.08	
Investment Repairs				0.00	
TOTAL CASH OVERHEAD COSTS/ACRE				648.08	
TOTAL CASH OVERHEAD COSTS/CWT				1.80	
TOTAL CASH COSTS/ACRE				2,201.45	
TOTAL CASH COSTS/CWT				6.12	
NET RETURNS ABOVE CASH COSTS				318.55	
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Equipment				169.59	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				169.59	
TOTAL NON-CASH OVERHEAD COSTS/CWT				0.47	
TOTAL COST/ACRE				2,371.04	
TOTAL COST/CWT				6.59	
NET RETURNS ABOVE TOTAL COST				148.96	

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TABLE 2. COSTS PER ACRE TO PRODUCE POTATOES

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per Acre					Total Cost	Your Cost
		Labor Cost	Fuel	Lube &Repairs	Material Cost	Custom/ Rent		
Preharvest:								
Irrigation	0.00	17.02	0.00	0.00	43.70	0.00	60.72	
Applying Fertilizer	0.00	0.00	0.00	0.00	268.10	15.00	283.10	
Tillage	0.36	12.48	10.16	8.34	0.00	0.00	30.98	
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	12.25	0.00	12.25	
Irrigation System Repairs	0.00	0.00	0.00	0.00	11.73	0.00	11.73	
Mark Out	0.11	4.01	3.65	1.68	71.70	0.00	81.04	
Seed Hauling	0.07	1.48	0.18	0.31	0.00	0.00	1.98	
Planting	0.29	12.73	8.47	11.52	327.40	0.00	360.12	
Applying Pesticides	0.07	2.77	1.44	0.79	119.23	26.25	150.48	
Consultant	0.00	0.00	0.00	0.00	0.00	26.00	26.00	
Hilling - Cultivation	0.13	4.92	3.25	2.37	0.00	0.00	10.54	
Chemigation-Fertigation	0.00	14.06	0.00	0.00	99.90	0.00	113.96	
General Pickup Use	1.35	29.97	11.24	4.43	0.00	0.00	45.63	
4-Wheeler Use	0.05	1.00	0.03	0.03	0.00	0.00	1.05	
Service Truck Use	0.04	0.95	0.30	0.12	0.00	0.00	1.37	
Fuel Truck Use	0.04	0.95	0.30	0.14	0.00	0.00	1.39	
TOTAL PREHARVEST COSTS	2.50	102.33	39.03	29.73	1,024.01	67.25	1,262.34	
Harvest:								
Roll Vines	0.09	1.99	1.83	0.87	0.00	0.00	4.70	
Vine Kill	0.07	1.57	1.44	0.79	22.60	0.00	26.40	
Digging	0.50	17.34	14.35	17.79	0.00	0.00	49.47	
Crop Hauling	1.55	26.78	4.28	7.27	0.00	0.00	38.34	
Dump Truck	0.03	0.69	0.36	0.08	0.00	0.00	1.13	
TOTAL HARVEST COSTS	2.24	48.38	22.26	26.80	22.60	0.00	120.04	
Storage:								
Potato Sorting	0.00	0.00	0.00	0.00	50.98	0.00	50.98	
TOTAL STORAGE COSTS	0.00	0.00	0.00	0.00	50.98	0.00	50.98	
Post Harvest:								
Tillage	0.16	5.61	5.46	3.23	0.00	0.00	14.30	
Assessments	0.00	0.00	0.00	0.00	61.56	0.00	61.56	
TOTAL POST HARVEST COSTS	0.16	5.61	5.46	3.23	61.56	0.00	75.86	
Interest on Operating Capital at 5.75%							44.15	
TOTAL OPERATING COSTS/ACRE	4.91	156.32	66.75	59.76	1,159.14	67.25	1,553.37	

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	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	13.20	21.12	15.84	2.64		60.72
Applying Fertilizer		212.60						70.50							283.10
Tillage	7.70	15.57						7.70							30.98
Crop Insurance								70.00							70.00
Irrigation Water Assessment								12.25							12.25
Irrigation System Repairs								11.73							11.73
Mark Out									81.04						81.04
Seed Hauling									1.98						1.98
Planting								360.12							360.12
Applying Pesticides								44.15			23.68	82.66			150.48
Consultant										26.00					26.00
Hilling - Cultivation										10.54					10.54
Chemigation-Fertigation										36.70	58.22	19.04			113.96
General Pickup Use	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	45.63
4-Wheeler Use	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	1.05
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	1.37
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	1.39
TOTAL PREHARVEST COSTS	16.52	231.70	3.53	3.53	3.53	3.53	3.53	175.72	493.45	89.97	106.55	121.07	6.17	3.53	1,262.34
Harvest:															
Roll Vines													4.70		4.70
Vine Kill													26.40		26.40
Digging													49.47		49.47
Crop Hauling													12.78	25.56	38.34
Dump Truck	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	1.13
TOTAL HARVEST COSTS	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	93.43	25.64	120.04
Storage:															
Potato Sorting														50.98	50.98
TOTAL STORAGE 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	50.98	50.98
Post Harvest:															
Tillage Assessments														14.30 61.56	14.30 61.56
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	75.86	75.86
Interest on Operating Capital @5.75%	0.08	1.19	1.21	1.22	1.24	1.26	1.28	2.12	4.48	4.92	5.43	6.01	6.48	7.23	44.15
TOTAL OPERATING COSTS/ACRE	16.68	232.97	4.82	4.84	4.86	4.87	4.89	177.92	498.02	94.97	112.05	127.15	106.09	163.24	1,553.37
CASH OVERHEAD															
General Overhead	2.79	2.79	2.79	2.79	2.79	2.79	2.79	2.79	2.79	2.79	2.79	2.79	2.79	2.79	39.00
Land Rent							440.00					</			

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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
Management Fee	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	112.00
Potato Handling Equip.- D&I														52.00	52.00
Property Taxes															0.00
Property Insurance								5.08							5.08
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	10.79	10.79	10.79	10.79	10.79	10.79	450.79	15.87	10.79	10.79	10.79	10.79	10.79	62.79	648.08
TOTAL CASH COSTS/ACRE	27.46	243.76	15.61	15.62	15.64	15.66	455.68	193.78	508.80	105.75	122.84	137.94	116.87	226.03	2,201.45

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TABLE 4. HOURLY EQUIPMENT COSTS

Yr	Description	Potatoes	Total	Cash Overhead		Operating			Total Costs/Hr.
		Hours Used	Hours Used	Capital Recovery	Insur- ance	Taxes	Lube& Repairs	Fuel	Total Oper.
15	4-wheeler	36	90	6.80	0.19	0.00	0.57	0.63	1.19
15	Disk Ripper 13'	133	175	27.52	0.68	0.00	16.99	0.00	16.99
15	Pickup 1 - 3/4 ton	320	800	8.03	0.15	0.00	3.28	8.32	11.60
15	Pickup 2 - 3/4 ton	320	800	8.03	0.15	0.00	3.28	8.32	11.60
15	Tandem Disk - 18'	153	175	20.18	0.50	0.00	7.37	0.00	7.37
15	Tractor - 160hp	203	350	24.56	0.91	0.00	8.44	18.57	27.01
15	Tractor - 200hp	196	500	22.61	0.80	0.00	11.64	23.19	34.84
15	Tractor - 225hp	268	350	38.06	1.34	0.00	11.34	30.69	42.02
15	Tractor - 250hp	467	500	30.96	1.09	0.00	9.14	28.98	38.11
15	Tractor 2 - 200hp	430	500	22.61	0.80	0.00	11.64	23.19	34.84
15	Truck 1P 10-Wheeler	217	345	20.44	0.65	0.00	4.69	2.76	7.45
15	Truck 2P 10-Wheeler	217	345	20.44	0.65	0.00	4.69	2.76	7.45
15	Truck 3P 10-Wheeler	217	345	20.44	0.65	0.00	4.69	2.76	7.45
15	Truck 4P 10-Wheeler	217	345	20.44	0.65	0.00	4.69	2.76	7.45
15	Truck 5P 10-Wheeler	217	345	20.44	0.65	0.00	4.69	2.76	7.45
15	Truck 6P 10-Wheeler	207	345	20.44	0.65	0.00	4.69	2.76	7.45
15	Potato Planter 6-Row CP	114	115	58.93	1.56	0.00	25.51	0.00	25.51
15	Basin Tillage Tool - 18' CP	102	105	21.08	0.61	0.00	5.80	0.00	5.80
15	Sprayer - 30' 150 gal.	113	115	4.21	0.11	0.00	1.95	0.00	1.95
15	Potato Planter#2 6-Row CP	114	115	58.93	1.56	0.00	25.51	0.00	25.51
15	Markout Bar - 18'	92	100	10.30	0.30	0.00	2.55	0.00	2.55
15	Ripper - 15'	129	200	11.77	0.29	0.00	7.49	0.00	7.49
15	Potato Harvester 4-Row CP	200	200	82.42	2.04	0.00	33.20	0.00	33.20
15	Potato Windrower#2 4-Row CP	200	200	37.46	0.93	0.00	15.09	0.00	15.09
15	Potato Vine Roller	72	75	3.20	0.09	0.00	0.40	0.00	0.40
15	Service Truck	34	80	36.69	1.21	0.00	2.87	7.13	9.99
15	Pickup 3 - 3/4ton	147	375	11.38	0.30	0.00	3.28	8.32	11.60
15	Pickup 4 - 3/4ton	147	375	11.38	0.30	0.00	3.28	8.32	11.60
15	Pickup 5 - 3/4ton	147	375	11.38	0.30	0.00	3.28	8.32	11.60
15	Fuel Truck	34	80	46.10	1.49	0.00	3.32	7.13	10.44
15	Dump Truck	25	25	58.18	1.98	0.00	2.61	11.40	14.01
15	Potato Planter Filler	114	115	5.97	0.17	0.00	4.35	0.00	4.35
15	Tank/injector -18'	92	100	6.44	0.18	0.00	2.07	0.00	2.07

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

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
						Insur- ance	Taxes	
15	4-wheeler	6,000.00	10	1,500.00	679.50	18.75	0.00	698.25
15	Disk Ripper 13'	45,000.00	10	7,957.86	5,351.98	132.39	0.00	5,484.37
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	10	5,835.77	3,924.79	97.09	0.00	4,021.87
15	Tractor - 160hp	131,000.00	25	11,078.38	9,549.39	355.20	0.00	9,904.59
15	Tractor - 200hp	157,000.00	20	20,144.91	12,559.91	442.86	0.00	13,002.77
15	Tractor - 225hp	185,000.00	20	23,737.63	14,799.90	521.84	0.00	15,321.74
15	Tractor - 250hp	215,000.00	20	27,586.97	17,199.88	606.47	0.00	17,806.35
15	Tractor 2 - 200hp	157,000.00	20	20,144.91	12,559.91	442.86	0.00	13,002.77
15	Truck 1P 10-Wheeler	95,000.00	20	4,000.00	7,834.82	247.50	0.00	8,082.32
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 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	Truck 6P 10-Wheeler	95,000.00	20	4,000.00	7,834.82	247.50	0.00	8,082.32
15	Potato Planter 6-Row CP	70,000.00	12	9,695.46	7,530.34	199.24	0.00	7,729.58
15	Basin Tillage Tool - 18' CP	25,800.00	15	2,476.97	2,459.80	70.69	0.00	2,530.50
15	Sprayer - 30' 150 gal.	5,000.00	12	692.53	537.88	14.23	0.00	552.11
15	Potato Planter#2 6-Row CP	70,000.00	12	9,695.46	7,530.34	199.24	0.00	7,729.58
15	Markout Bar - 18'	12,000.00	15	1,152.08	1,144.10	32.88	0.00	1,176.98
15	Ripper - 15'	22,000.00	10	3,890.51	2,616.52	64.73	0.00	2,681.25
15	Potato Harvester 4-Row CP	154,000.00	10	27,233.57	18,315.67	453.08	0.00	18,768.75
15	Potato Windrower#2 4-Row CP	70,000.00	10	12,378.90	8,325.30	205.95	0.00	8,531.25
15	Potato Vine Roller	2,800.00	15	268.82	266.96	7.67	0.00	274.63
15	Service Truck	40,000.00	20	3,000.00	3,261.14	107.50	0.00	3,368.64
15	Pickup 3 - 3/4ton	41,000.00	10	9,000.00	4,740.37	125.00	0.00	4,865.37
15	Pickup 4 - 3/4ton	41,000.00	10	9,000.00	4,740.37	125.00	0.00	4,865.37
15	Pickup 5 - 3/4ton	41,000.00	10	9,000.00	4,740.37	125.00	0.00	4,865.37
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	Potato Planter Filler	8,000.00	15	768.05	762.73	21.92	0.00	784.65
15	Tank/injector -18'	7,500.00	15	720.05	715.06	20.55	0.00	735.61
TOTAL		2,261,100.00	-	273,458.82	211,310.39	6,336.40	0.00	217,646.78
90% of New Cost*		2,034,990.00	-	246,112.94	190,179.35	5,702.76	0.00	195,882.11

*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								
TOTAL INVESTMENT	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00

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TABLE 6. RANGING ANALYSIS - POTATOES

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

	YIELD(CWT)						
	345.00	350.00	355.00	360.00	365.00	370.00	375.00
OPERATING COSTS/ACRE:							
Preharvest	1,262.34	1,262.34	1,262.34	1,262.34	1,262.34	1,262.34	1,262.34
Harvest	118.39	118.94	119.49	120.04	120.59	121.13	121.68
Storage	50.98	50.98	50.98	50.98	50.98	50.98	50.98
Post Harvest	75.86	75.86	75.86	75.86	75.86	75.86	75.86
Interest on Operating Capital @ 5.75%	44.15	44.15	44.15	44.15	44.15	44.15	44.15
TOTAL OPERATING COSTS/ACRE	1,551.72	1,552.27	1,552.82	1,553.37	1,553.91	1,554.46	1,555.01
TOTAL OPERATING COSTS/CWT	4.50	4.44	4.37	4.31	4.26	4.20	4.15
CASH OVERHEAD COSTS/ACRE	648.08	648.08	648.08	648.08	648.08	648.08	648.08
TOTAL CASH COSTS/ACRE	2,199.80	2,200.35	2,200.90	2,201.45	2,202.00	2,202.55	2,203.09
TOTAL CASH COSTS/CWT	6.38	6.29	6.20	6.12	6.03	5.95	5.87
NON-CASH OVERHEAD COSTS/ACRE	169.59	169.59	169.59	169.59	169.59	169.59	169.59
TOTAL COSTS/ACRE	2,369.39	2,369.94	2,370.49	2,371.04	2,371.58	2,372.13	2,372.68
TOTAL COSTS/CWT	6.87	6.77	6.68	6.59	6.50	6.41	6.33

Net Return Per Acre Above Operating Costs For Potatoes

PRICE (\$/cwt)	YIELD (cwt/acre)						
Potatoes	345.00	350.00	355.00	360.00	365.00	370.00	375.00
6.50	690.78	722.73	754.68	786.63	818.59	850.54	882.49
6.75	777.03	810.23	843.43	876.63	909.84	943.04	976.24
7.00	863.28	897.73	932.18	966.63	1,001.09	1,035.54	1,069.99
7.25	949.53	985.23	1,020.93	1,056.63	1,092.34	1,128.04	1,163.74
7.50	1,035.78	1,072.73	1,109.68	1,146.63	1,183.59	1,220.54	1,257.49
7.75	1,122.03	1,160.23	1,198.43	1,236.63	1,274.84	1,313.04	1,351.24
8.00	1,208.28	1,247.73	1,287.18	1,326.63	1,366.09	1,405.54	1,444.99

Net Return Per Acre Above Cash Costs For Potatoes

PRICE (\$/cwt)	YIELD (cwt/acre)						
Potatoes	345.00	350.00	355.00	360.00	365.00	370.00	375.00
6.50	42.70	74.65	106.60	138.55	170.50	202.45	234.41
6.75	128.95	162.15	195.35	228.55	261.75	294.95	328.16
7.00	215.20	249.65	284.10	318.55	353.00	387.45	421.91
7.25	301.45	337.15	372.85	408.55	444.25	479.95	515.66
7.50	387.70	424.65	461.60	498.55	535.50	572.45	609.41
7.75	473.95	512.15	550.35	588.55	626.75	664.95	703.16
8.00	560.20	599.65	639.10	678.55	718.00	757.45	796.91

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TABLE 6. RANGING ANALYSIS CONTINUED

Net Return Per Acre Above Total Costs For Potatoes

PRICE (\$/cwt)	YIELD (cwt/acre)						
Potatoes	345.00	350.00	355.00	360.00	365.00	370.00	375.00
6.50	-126.89	-94.94	-62.99	-31.04	0.92	32.87	64.82
6.75	-40.64	-7.44	25.76	58.96	92.17	125.37	158.57
7.00	45.61	80.06	114.51	148.96	183.42	217.87	252.32
7.25	131.86	167.56	203.26	238.96	274.67	310.37	346.07
7.50	218.11	255.06	292.01	328.96	365.92	402.87	439.82
7.75	304.36	342.56	380.76	418.96	457.17	495.37	533.57
8.00	390.61	430.06	469.51	508.96	548.42	587.87	627.32

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

	Storage Costs	Field-Run Cost per Cwt	Paid Yield Cost per Cwt
Field-Run Yield		360	
Paid Yield %	95%		342
Base Cost to Grow, Harvest and Sort		\$6.59	\$6.93
Storage System Annual Ownership Costs	\$0.357	\$0.357	\$0.376
Base Cost + Storage Ownership Cost		\$6.95	\$7.31
Storage System Annual Repair Costs	\$0.041	\$0.041	\$0.04
Base + Storage System Ownership & Repairs		\$6.99	\$7.35
	Cumulative Storage Op. Costs	Cumulative Base + All Storage Costs	Cumulative Base + All Storage Costs
October	\$0.205	\$7.19	\$7.57
November*	\$0.372	\$7.36	\$7.75
December	\$0.456	\$7.44	\$7.83
January	\$0.539	\$7.53	\$7.92
February	\$0.623	\$7.61	\$8.01
March	\$0.706	\$7.69	\$8.10
April*	\$0.890	\$7.88	\$8.29
May	\$0.992	\$7.98	\$8.40
June	\$1.112	\$8.10	\$8.52

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

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 potatoes from storage.

* Indicates month when sprout inhibitor applied.

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