

2015 Cost of Potato Production Study
for Washington's Columbia Basin With Comparison to 2014

Cost of Production Changes per Acre and Per Hundredweight
Per Acre Dollar and Percentage Change in Costs
Detailed Cost of Production per Acre and Change from 2014
Monthly and Cumulative Storage Costs per Hundredweight
Price Received and Cumulative Production & Storage Costs by Month

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2015 Potato Cost of Production Study Overview for Washington

Cost of production estimates in the following tables are typical or representative production costs for the Columbia Basin of Washington. These are not average cost of production values. Farm size, crop rotation, water source, type of irrigation system, age and type of equipment, and the quality and intensity of management all influence costs. Each farm has a unique set of resources with different levels of productivity, different production problems, and therefore, different costs. A single cost of production estimate is presented for Washington, while recognizing the complexity of the issue. This study was funded by United Potato Growers of America and conducted by Paul Patterson, retired University of Idaho Extension Agricultural Economist.

Procedures and Assumptions

Production practice information was collected from potato growers in Washington's Columbia Basin in 2012. This data formed the basis for developing a model farm. The size of the model farm is 3,500 acres with 1,500 acres of potatoes. Growers provided information on tillage practices, inputs used, irrigation practices, harvesting and storage, basically all aspects of raising potatoes. All resources used in the production process are valued at a market rate, or "opportunity cost". Therefore, costs in the following tables are economic costs, not just accounting or cash costs. The cost of production estimate, or enterprise budget, is for Russet Burbank. Input prices were collected in 2015 from chemical fertilizer dealers and other input suppliers. A center pivot irrigation system was used on the model farm. Irrigation power costs were based on pressurization only of surface water, no lift. A Washington utility power rate was used in these calculations. Labor rates include a base wage, plus a percentage to account for various payroll taxes (FICA, FUTA, SUTA), workman's compensation, as well as typical benefits for that class of labor such as paid vacation/personal leave days, health insurance, and bonuses.

A general overhead charge was calculated at ~2.5% of cash operating costs. A management charge was calculated at ~5% of total expenses. Machinery prices used in calculating capital recovery (or depreciation and interest) were 75% of replacement cost new. Land costs were based on a 1-year cash rent equivalent specifically for potatoes. Costs of production estimates were calculated using the *Budget Planner* software from the University of California, Davis.

The base cost of production in tables 1-3 include the cost to grow, harvest and sort potatoes. Storage costs are not included in these tables. Storage costs (ownership, repairs and monthly operating costs) are added to the base production cost and shown in Table 4. A chart showing breakeven production costs by month (both field-run and paid-yield) and potato prices available through late December helps answer the question of whether market prices are covering grower costs for the model farm.

Table 1. Cost of production per acre and per hundredweight (field-run yield) summary, showing operating, ownership and total costs for 2014 and 2015 and dollar and percent changes.

Table 2. Per acre cost and percentage change from 2014 to 2015 for major cost categories.

Table 3. Detailed Washington cost of production for 2015 and 2014 with dollar and percent changes.

Table 4. Cost of production per hundredweight including storage ownership and repair costs and monthly storage operating costs

Chart with 2015 cost of production and storage costs per hundredweight by month (both field-run and paid-yield) and USDA's monthly all potato price for Washington and NAPMN's Washington GRI.

Table 1. Washington-Oregon potato cost of production changes per acre and per hundredweight from 2014 to 2015.

	12/15/2015	
	<u>Per Acre</u>	<u>Per Cwt</u>
2014 Operating Cost	\$2,941	\$4.67
2015 Operating Cost	\$2,917	\$4.63
\$ Change	-\$24	-\$0.04
% Change	-0.8%	-0.8%
<hr/>		
2014 Ownership Cost	\$1,265	\$2.01
2015 Ownership Cost	\$1,281	\$2.03
\$ Change	\$16	\$0.03
% Change	1.3%	1.3%
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2014 Total Cost	\$4,206	\$6.68
2015 Total Cost	\$4,199	\$6.66
\$ Change	-\$8	-\$0.01
% Change	-0.2%	-0.2%

Note: rounded values may not add up.
Op. = Operating and Own. = Ownership

[Note: all values in this sheet are linked to Table 3.](#)

Table 2. Per acre and percentage change in costs to grow and harvest Washington-Oregon irrigated Russet Burbank potatoes from 2014 to 2015.

Item	Washington Change from 2014	
Yield	0	0.0%
<u>Operating Inputs</u>	<u>\$</u>	<u>%</u>
Seed:	\$1.15	0.3%
Fertilizer:	\$14.35	2.2%
Pesticides & Chemicals:	-\$11.27	-1.3%
Custom & Consultants:	-\$0.50	-0.3%
Irrigation:	\$5.37	3.3%
Machinery: Fuel & Repairs	-\$38.58	-19.3%
Field Labor	\$4.76	2.2%
Sorting Labor, Power & Repairs	\$2.52	2.7%
Other: Fees & Crop Insurance	\$0.00	0.0%
Operating Interest	-\$1.65	-1.7%
Total Operating Costs	-\$23.85	-0.8%
Operating Costs per Unit	-\$0.04	-0.8%
<u>Ownership Costs:</u>		
Potato Handling Equipment	\$3.00	3.4%
Tractors & Field Equipment	\$6.00	3.4%
Land	\$10.00	1.4%
Overhead	-\$1.00	-1.4%
Management Fee	-\$2.00	-1.0%
Total Ownership Costs	\$16.34	1.29%
Ownership Costs per Unit	\$0.03	1.29%
<u>Total Costs:</u>		
Total Costs per Acre	-\$7.51	-0.2%
Total Cost per Unit	-\$0.01	-0.2%

[Note: all values in this sheet are linked to](#)

Table 3. 2015 Washington Irrigated Russet Burbank Commercial Potatoes: With Fumigation and No Storage. Comparison with 2014.

					Final 12/15/2015		
Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre	Comparison		
					2014	Yield Change	
Gross Returns					630	0	0.0%
Potatoes	630	cwt	\$7.00	\$4,410.00			
Operating Inputs							
Seed:					\$433.55		
G-3 Burbank Potato Seed	23	cwt	\$16.75	\$385.25	\$432.40	\$1.15	0.3%
Seed Cutting	23	cwt	\$2.10	\$48.30	\$385.25	\$0.00	0.0%
					\$47.15	\$1.15	2.4%
Fertilizer:					\$655.70		
Dry Nitrogen - Preplant	255	lb	\$0.54	\$137.70	\$641.35	\$14.35	2.2%
Dry P2O5	285	lb	\$0.56	\$159.60	\$147.90	-\$10.20	-6.9%
K2O	315	lb	\$0.43	\$135.45	\$148.20	\$11.40	7.7%
Sulfur	155	lb	\$0.25	\$38.75	\$129.15	\$6.30	4.9%
Micronutrients & Foliars	1	ac	\$35.00	\$35.00	\$38.75	\$0.00	0.0%
Liquid Nitrogen	125	lb	\$0.72	\$90.00	\$35.00	\$0.00	0.0%
Liquid P2O5	80	lb	\$0.74	\$59.20	\$88.75	\$1.25	1.4%
					\$53.60	\$5.60	10.4%
Pesticides & Chemicals:					\$846.04		
Vapam 42%	35	gal	\$5.65	\$197.75	\$857.31	-\$11.27	-1.3%
Telone II	15	gal	\$16.00	\$240.00	\$192.50	\$5.25	2.7%
Potato Seed Treatment	23	cwt	\$0.85	\$19.55	\$255.00	-\$15.00	-5.9%
Quadris Flowable	6.0	fl oz	\$2.35	\$14.10	\$19.55	\$0.00	0.0%
Ultra Flourish	8.0	fl oz	\$2.58	\$20.64	\$15.30	-\$1.20	-7.8%
Eptam 7E	4.0	pt	\$6.00	\$24.00	\$21.60	-\$0.96	-4.4%
Metribuzin 75DF	1.0	lb	\$14.00	\$14.00	\$25.00	-\$1.00	-4.0%
Prowl 3.3EC	2.0	pt	\$5.00	\$10.00	\$13.75	\$0.25	1.8%
Bravo Weather Stik (3x)	4.5	pt	\$4.50	\$20.25	\$10.30	-\$0.30	-2.9%
Endura	5.5	oz	\$5.00	\$27.50	\$21.38	-\$1.13	-5.3%
Tanos	6.0	oz	\$2.80	\$16.80	\$29.43	-\$1.93	-6.5%
Omega 500DF	5.50	fl oz	\$3.30	\$18.15	\$16.50	\$0.30	1.8%
Revus Top (2x)	11.00	fl oz	\$2.35	\$25.85	\$20.08	-\$1.93	-9.6%
Gavel 75DF	2.00	lb	\$8.00	\$16.00	\$25.85	\$0.00	0.0%
Ranman	2.75	floz	\$4.50	\$12.38	\$17.00	-\$1.00	-5.9%
Dimethoate 4EC (2x)	2.0	pt	\$5.65	\$11.30	\$0.00	\$12.38	
Fulfill WDG	5.5	oz	\$6.35	\$34.93	\$12.60	-\$1.30	-10.3%
Movento (2x)	10.00	fl oz	\$7.05	\$70.50	\$37.13	-\$2.21	-5.9%
Oberon 2SC	10.00	fl oz	\$2.50	\$25.00	\$71.00	-\$0.50	-0.7%
Asana XL	5.80	fl oz	\$0.75	\$4.35	\$25.00	\$0.00	0.0%
Reglone	1.0	qt	\$23.00	\$23.00	\$4.35	\$0.00	0.0%
					\$24.00	-\$1.00	-4.2%
Custom & Consultants:					\$151.50		
Soil & Nematode Sampling	1	ac	\$6.00	\$6.00	\$152.00	-\$0.50	-0.3%
Custom Fumigation - Shanked	1	ac	\$26.00	\$26.00	\$5.50	\$0.50	9.1%
Custom Fumigation - Deep Inj.	1	ac	\$35.00	\$35.00	\$26.00	\$0.00	0.0%
Custom Fertilize	1	ac	\$8.25	\$8.25	\$35.00	\$0.00	0.0%
Custom Air Spray-5Gal	7	ac	\$8.75	\$61.25	\$8.50	-\$0.25	-2.9%
Crop Consultant	1	ac	\$15.00	\$15.00	\$63.00	-\$1.75	-2.8%
					\$14.00	\$1.00	7.1%
Irrigation:					\$169.17		
Water Assessment	1	ac	\$80.00	\$80.00	\$163.80	\$5.37	3.3%
Irrigation Power-CP *	37	acin	\$1.90	\$70.30	\$75.00	\$5.00	6.7%
Irrigation Repairs-CP *	37	acin	\$0.51	\$18.87	\$70.30	\$0.00	0.0%
					\$18.50	\$0.37	2.0%
Machinery:					\$161.40		
Fuel - Gas	4.91	gal	\$2.70	\$13.26	\$199.97	-\$38.58	-19.3%
Fuel - Farm Diesel	24.3	gal	\$2.35	\$57.15	\$18.17	-\$4.91	-27.0%
Fuel - Road Diesel	3.66	gal	\$3.00	\$10.98	\$83.90	-\$26.75	-31.9%
Lube	1	ac	\$12.21	\$12.21	\$14.82	-\$3.84	-25.9%
Machinery Repairs	1	ac	\$67.80	\$67.80	\$17.54	-\$5.33	-30.4%
					\$65.54	\$2.26	3.4%
Field Labor:					\$221.49		
Equipment Operator Labor	3.91	hr	\$20.35	\$79.57	\$216.74	\$4.76	2.2%
Truck Driver Labor	2.88	hr	\$16.25	\$46.80	\$77.81	\$1.76	2.3%
Irrigation Labor -CP*	1.48	hr	\$20.35	\$30.12	\$45.79	\$1.01	2.2%
Irrigation Labor: Chem. - Fert.	1.20	hr	\$20.35	\$24.42	\$29.45	\$0.67	2.3%
General Farm Labor	2.61	hr	\$15.55	\$40.59	\$23.88	\$0.54	2.3%
					\$39.80	\$0.78	2.0%
Sorting:					\$96.08		
Sorting Labor Costs	630	cwt	\$0.119	\$74.66	\$93.56	\$2.52	2.7%
Sorting Equip. Repair & Power	630	cwt	\$0.034	\$21.42	\$72.77	\$1.89	2.6%
					\$20.79	\$0.63	3.0%
Other:					\$87.00		
Fees & Assessments	580	cwt	\$0.15	\$87.00	\$87.00	\$0.00	0.0%
				\$0.00	\$87.00	\$0.00	0.0%

Table 3. **2015** Washington Irrigated Russet Burbank Commercial Potatoes: With Fumigation and No Storage. Comparison with 2014.

					Final 12/15/2015		
Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre	Comparison		
Operating Interest @ 5.75%				\$95.52	\$97.17	-\$1.65	-1.7%
Total Operating Costs				\$2,917	\$2,941	-\$23.85	-0.8%
Operating Costs per Unit				\$4.63	\$4.67	-\$0.04	-0.8%
Net Returns Above Operating Expenses				\$1,493	\$1,446		
Ownership Costs:							
Equipment Insurance, Fees & Taxes				\$10.30	\$9.96	\$0.34	3.4%
Field Equipment Depreciation & Interest				\$181.00	\$175.00	\$6.00	3.4%
Potato Handling Equipment Deprec. & Interest				\$92.00	\$89.00	\$3.00	3.4%
Land **				\$725	\$715.00	\$10.00	1.4%
Overhead				\$73.00	\$74.00	-\$1.00	-1.4%
Management Fee				\$200.00	\$202.00	-\$2.00	-1.0%
Total Ownership Costs				\$1,281	\$1,265	\$16.34	1.3%
Ownership Costs per Unit				\$2.03	\$2.01	\$0.03	1.3%
Total Costs per Acre				\$4,199	\$4,206	-\$7.51	-0.2%
Total Cost per Unit				\$6.66	\$6.68	-\$0.01	-0.2%
Returns to Risk				\$211			
Notes:							
* Center pivot. ** Includes irrigation system ownership costs.							
Blue font indicates an increase.							
A red font indicates a decrease.							
A green font indicates a change in product or procedure to derive the cost.							
Procedural changes can result in different costs than were published the previous year.							
Breakeven Analysis:							
	-	Base	+				
	10%		10%				
		Yield					
Price	567	630	693				
Operating Cost Breakeven	\$5.15	\$4.63	\$4.21				
Ownership Cost Breakeven	\$2.26	\$2.03	\$1.85				
Total Cost Breakeven	\$7.41	\$6.66	\$6.06				
		Price					
Yield	\$6.30	\$7.00	\$7.70				
Operating Cost Breakeven	463.1	416.8	378.9				
Ownership Cost Breakeven	203.4	183.0	166.4				
Total Cost Breakeven	666.5	599.8	545.3				

Table 4. 2015 Russet Burbank cost of production, monthly storage costs and cumulative production and storage costs for Washington-Oregon.

	12/15/2015	Storage Operating Costs	Field Run Cost per Cwt	Paid Yield Cost per Cwt
Field-Run Yield			630	
Paid Yield %		92%		580
Base Cost to Grow, Harvest & Sort			\$6.66	\$7.24
Storage System Annual Ownership Costs		\$0.357	\$0.357	\$0.388
Base Cost + Storage Ownership Cost			\$7.02	\$7.63
Storage System Annual Repairs		\$0.041	\$0.041	\$0.045
Base + Storage System Ownership & Repairs			\$7.06	\$7.68
		Cumulative Storage Op. Costs	Cumulative Base + Storage Costs	Cumulative Base + Storage Costs
October		\$0.194	\$7.26	\$7.87
November*		\$0.359	\$7.42	\$8.04
December		\$0.439	\$7.50	\$8.12
January		\$0.520	\$7.58	\$8.20
February		\$0.600	\$7.66	\$8.28
March		\$0.681	\$7.74	\$8.36
April*		\$0.862	\$7.92	\$8.54
May		\$0.962	\$8.02	\$8.64
June		\$1.078	\$8.14	\$8.75

Data entered directly by user. All other values are calculated.

Calculated Values.

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.

2015 Washington Cost of Production with Storage Costs by Month & Fresh Market Potato Prices: USDA-NASS and NAPMN

