# Enterprise Budget

## Potatoes, Fresh
## South Central Region

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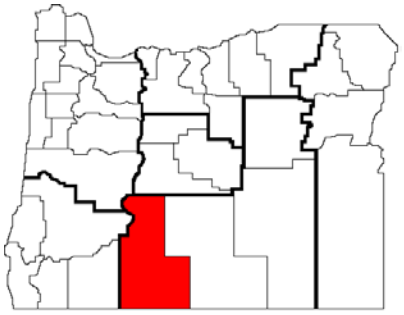

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This enterprise budget estimates the typical costs and returns of producing fresh market potatoes in the Klamath Basin of Oregon. While efforts were made to reflect common practices, it is not representative of any particular farm and should be used only as a guide to estimating actual costs. The major assumptions used in constructing this budget are discussed below. Assistance provided by area producers is greatly appreciated.

**Cropping Pattern**
This budget is based on a 1,500-acre farm with 300 acres in potatoes and 1,200 acres in grain and alfalfa hay. Typical yield in this budget is 450 hundredweight (cwt) per acre.

**Land**
A land lease charge of $300 per acre is included to represent the cost of leasing or owning land. This charge is based on the cost of leasing good quality land that includes irrigation pumps and mainlines.

**Labor**
General, truck and tractor driver labor cost $14, $16 and $20 per hour, respectively, which includes social security, workers' compensation, unemployment insurance, and other labor overhead expenses. For this study, owner labor is valued at the same rate as tractor driver rates, and all labor is assumed to be a cash cost. Tractor labor hours are calculated based on machinery hours plus ten percent.

**Capital**
Interest on operating capital (4.5 percent) is treated as a cash expense. One-third of the cash expenses are borrowed for 12 months. Interest on intermediate and long-term capital (5 percent) is treated as a non-cash opportunity cost to the owner.

**Machinery and Equipment**
The machinery and equipment used in this budget are sufficient for a 1,500-acre farm growing small grains, alfalfa hay and potatoes. The machinery and equipment hours reflect producing potatoes, small grains and alfalfa hay. A detailed breakdown of machinery values is shown in Table 2. Estimated machinery costs are shown in Table 3. The machinery costs are estimated based on the total farm use of the machinery. Gasoline costs $3.00 and off-road diesel $2.50 per gallon. Table 4 shows the labor, variable, and fixed costs for certain machinery operations.

**Operations**
The cultural operations are listed approximately in the order in which they are performed. In the fall, the previous year's crop residues are chopped, rototilled, disked twice, and ripped. In early spring, moldboard plow and chisel plow operations are performed prior to fumigation. Following two additional tillage operations, a pre-plant fertilizer is broadcast.

In late spring, a three-person crew mark-out beds and plant 25 cwt of seed potatoes per acre, at a cost of $17 per cwt, with a 4-row planter. Fertilizer can be applied pre-plant by broadcast, banded at planting, top dressed post-emergence, or foliar applied. Fertilizer rates are 220 pounds of nitrogen (N), 120 pounds phosphorous (P), 250 pounds potassium (K) and 135 pounds of sulfur (S). Weed control consists of herbicides applied pre- and post-emergence and/or mechanical cultivation.

A three-person crew sets up solid-set sprinkler irrigation in the field. A total of 16 irrigation sets apply 24-inches of water at a cost of $6.25 per acre-inch. Water-soluble nitrogen is injected into the irrigation lines during four irrigation sets.

Pesticides are custom aerial applied for blight control, aphid control, and sprout inhibition. Prior to harvest, a chemical defoliant is used to knock down vines. The field is rolled and the vines are cut before digging. The potato harvest involves a windrower and bulker to dig and pick up potatoes, which are delivered to a storage facility approximately 30 miles from the farm using five 10-wheel trucks.

**Results**
The average price (based on five-year average prices for fresh potatoes from USDA reports) for fresh potatoes is $12.56 per cwt with a long-run average yield of 450 cwt per acre for a gross income of $5,651. Variable cash production costs, including packing shed costs, are $5,072 per acre, giving a net return above variable cash costs of $579 per acre. Total costs are $6,154 per acre when all costs are considered. A break-even price of $11.27 per cwt would be required to cover variable cash costs, and $13.68 per cwt to cover total costs. Tables 5 and 6 show the returns per acre for cash and total costs at various yields and prices.

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Table 1. Fresh Market Potatoes, Klamath Basin, $/Acre Economic Costs and Returns

| GROSS INCOME, net processing costs | | | Quantity | Unit | $/Unit[1] | Total | Price/cwt |
|---|---|---|---|---|---|---|---|
| #1 Fresh | | | 306 | cwt | $15.68 | 4,798.08 | 15.68 |
| #2 Fresh | | | 54 | cwt | $10.13 | 547.02 | 10.13 |
| Class B | | | 45 | cwt | $4.05 | 182.25 | 4.05 |
| Culls | | | 45 | cwt | $2.75 | 123.75 | 2.75 |
| Total GROSS Income | | | 450 | | | 5,651.10 | 12.56 |
| | | | | | | | |
| VARIABLE CASH COSTS Description | | | Labor | Machinery | Materials | Total | Cost/cwt |
| **Preplant: Land Preparation** | | | | | | | |
| Rototill | 1 | appl | $12.28 | $24.06 | $0.00 | $36.34 | $0.08 |
| Disc | 2 | appl | 5.43 | 10.31 | 0.00 | 15.74 | 0.03 |
| Chisel | 0.25 | appl | 0.94 | 1.88 | 350.00 | 352.81 | 0.78 |
| Fumigant | | | | | | | |
| **Cultural Practices** | | | | | | | |
| Plant Potatoes | 1 | appl | 7.64 | 15.94 | 425.00 | 448.58 | 1.00 |
| Seed: cut, treatment, preparation, etc. | | | | | | | |
| Insect Control, In-furrow | 1 | appl | 0.00 | 0.00 | 7.00 | 7.00 | 0.02 |
| Weed Control - Cultivate | 1 | appl | 5.73 | 6.96 | 0.00 | 12.69 | 0.03 |
| Irrigate | 16 | appl | 84.00 | 1.43 | 150.04 | 235.48 | 0.52 |
| Irrigate Pipe Rental | | | 0.00 | 0.00 | 175.00 | 175.00 | 0.39 |
| Weed Control - Chemicals, custom applied | 1 | appl | 0.00 | 0.00 | 55.00 | 55.00 | 0.12 |
| Fungicide, In-furrow & (3x) chemigated | 4 | appl | 0.00 | 0.00 | 75.00 | 75.00 | 0.17 |
| Fertilizer | | | 0.00 | 0.00 | 450.00 | 450.00 | 1.00 |
| **Pre-Harvest** | | | | | | | |
| Vine Dessicant, custom applied - aerial | 0.5 | appl | 0.00 | 0.00 | 15.00 | 15.00 | 0.03 |
| Roll Crop | 1 | appl | 4.30 | 2.42 | 0.00 | 6.72 | 0.01 |
| **Harvest** | | | | | | | |
| Windrow & Dig Potatoes | | | 19.64 | 53.72 | 0.00 | 73.37 | 0.16 |
| Haul From Field | | | 51.43 | 75.70 | 0.00 | 127.13 | 0.28 |
| Store Potatoes, On-farm Shed | 7 | months | 0.00 | 54.17 | 180.00 | 234.17 | 0.52 |
| Utilities | $0.40 | per cwt | | | | | |
| Packing Shed Costs | 5.75 | $ per cwt | 0.00 | 0.00 | 2,587.50 | 2,587.50 | 5.75 |
| Shop/Shed | | | 0.00 | 2.50 | 0.00 | 2.50 | 0.01 |
| Pickups & Quads | | | 0.00 | 134.27 | 0.00 | 134.27 | 0.30 |
| Miscellaneous | | | 0.00 | 1.43 | 15.00 | 16.43 | 0.04 |
| Interest on Operating Capital | | | 0.00 | 0.00 | 11.38 | 11.38 | 0.03 |
| Total VARIABLE COSTS | | | $191.37 | $384.79 | $4,495.92 | $5,072.09 | $11.27 |
| | | | | | | | |
| GROSS INCOME minus VARIABLE COSTS | | | | | | $579.01 | $1.29 |
| | | | | | | | |
| FIXED CASH COSTS | | | | | Unit | Total | Cost/cwt |
| CASH Costs | | | | | | | |
| Property Insurance | | | | | acre | 5.00 | 0.01 |
| Annual Cash Rent Payment[2] | | | | | acre | 300.00 | 0.67 |
| Total CASH Costs | | | | | | $305.00 | $0.68 |
| | | | | | | | |
| GROSS INCOME minus VARIABLE AND FIXED CASH COSTS | | | | | | $274.01 | $0.61 |
| | | | | | | | |
| NON-CASH Costs | | | | | | | |
| Machinery and Equipment - Depreciation & Interest | | | | | acre | $372.83 | $0.83 |
| Pickups & Quads - Depreciation & Interest | | | | | acre | 167.56 | 0.37 |
| Trucks - Depreciation & Interest | | | | | acre | 105.59 | 0.23 |
| Potato Storage Shed - Depreciation & Interest | | | | | acre | 126.39 | 0.28 |
| Shop/Shed - Depreciation & Interest | | | | | acre | 4.46 | 0.01 |
| Total NON-CASH Costs | | | | | | $776.83 | $1.73 |
| | | | | | | | |
| Total FIXED COSTS | | | | | | $1,081.83 | $2.40 |
| | | | | | | | |
| Total of All Costs Per Acre | | | | | | $6,153.92 | $13.68 |
| | | | | | | | |
| **Net Projected Returns** | | | | | | (502.82) | ($1.12) |

[1]Five-year average prices from USDA reports.

[2]It is assumed the tenant pays the annual irrigation assessment and electrical pumping costs on leased land.

Table 2. Machinery Cost Assumptions

| Machine | Size | Market Value | Hours or Miles of Annual Use | Expected Life (yrs) |
|---|---|---|---|---|
| Tractor - 125 hp 4WD | | $ 82,000 | 74 | 10 |
| Tractor - 150 hp 4WD | | 115,000 | 245 | 10 |
| Tractor - 175 hp 4WD | | 140,000 | 311 | 10 |
| Tractor - 200 hp 4WD | | 170,000 | 487 | 10 |
| Tractor - 225 hp 4WD | | 182,000 | 321 | 10 |
| Tractor - 75 hp 4WD | | 42,500 | 64 | 10 |
| Bed Shaper | | 13,292 | 74 | 10 |
| Chisel | | 28,500 | 206 | 15 |
| Cultivator | | 4,980 | 86 | 5 |
| Planter - 4 Row | | 55,000 | 115 | 6 |
| Digger 2 Row | | 70,000 | 295 | 20 |
| Windrow | | 50,000 | 295 | 10 |
| Ripper | | 29,000 | 56 | 15 |
| Disc | | 21,000 | 190 | 15 |
| Roller - Flat | | 7,500 | 64 | 10 |
| Rototiller | | 29,000 | 55 | 20 |
| Pickup - 1/2 Ton 4WD | 4 units | 25,000 | 15,000 | 5 |
| Pickup - 3/4 Ton 4WD | 2 units | 30,000 | 15,000 | 5 |
| Potato Truck - 20' Bed | 5 units | 60,000 | 2,893 | 10 |
| Quads | 2 units | 10,000 | 2,000 | 3 |
| Pipe Trailer | | 21,500 | NA | 10 |
| Potato Storage Shed | 100,000 cwt | 650,000 | N/A | 30 |
| Shop/Shed | 40' x 80' | 25,000 | N/A | 35 |

Table 3. Machinery Cost Calculations

| Machine | Size | ----- Variable Costs ----- Fuel & Lube | Repairs & Maint. | ----- Fixed Costs ----- Deprec-iation | Interest | Total Cost |
|---|---|---|---|---|---|---|
| | | ---------- Costs per Hour ---------- | | | | |
| Tractor - 125 hp 4WD | | $15.74 | $0.18 | $70.70 | $27.98 | $114.60 |
| Tractor - 150 hp 4WD | | 18.89 | 0.85 | 29.29 | 39.55 | 88.58 |
| Tractor - 175 hp 4WD | | 22.04 | 1.31 | 30.22 | 46.51 | 100.07 |
| Tractor - 200 hp 4WD | | 25.19 | 2.49 | 24.46 | 55.19 | 107.32 |
| Tractor - 225 hp 4WD | | 28.33 | 1.75 | 38.50 | 60.15 | 128.73 |
| Tractor - 75 hp 4WD | | 9.44 | 0.08 | 41.82 | 14.41 | 65.75 |
| Bed Shaper | | 0.00 | 3.29 | 14.12 | 4.05 | 21.46 |
| Chisel | | 0.00 | 12.53 | 7.22 | 8.68 | 28.43 |
| Cultivator | | 0.00 | 0.96 | 9.07 | 1.52 | 11.54 |
| Planter - 4 Row | | 0.00 | 11.65 | 62.60 | 16.74 | 91.00 |
| Digger 2 Row | | 0.00 | 27.04 | 9.30 | 21.31 | 57.64 |
| Windrow | | 0.00 | 14.64 | 13.28 | 15.22 | 43.13 |
| Ripper | | 0.00 | 7.58 | 26.96 | 8.83 | 43.36 |
| Disc | | 0.00 | 7.87 | 5.76 | 6.39 | 20.03 |
| Roller - Flat | | 0.00 | 1.74 | 9.11 | 2.28 | 13.13 |
| Rototiller | | 0.00 | 11.53 | 20.54 | 8.83 | 40.90 |
| | | ---------- Costs per Mile ---------- | | | | |
| Pickup - 1/2 Ton 4WD | 4 units | 0.28 | 0.12 | 0.25 | 0.11 | 0.76 |
| Pickup - 3/4 Ton 4WD | 2 units | 0.30 | 0.16 | 0.32 | 0.14 | 0.92 |
| Quads | 2 units | 0.18 | 0.44 | 2.38 | 0.19 | 3.19 |
| Potato Truck - 20' Bed | 5 units | 0.52 | 1.05 | 1.22 | 0.97 | 3.76 |
| | | ---------- Costs per Acre ---------- | | | | |
| Pipe Trailer | | 0.00 | 1.43 | 7.17 | 1.79 | 10.39 |
| Potato Storage Shed | 100,000 cwt | 0.00 | 54.17 | 72.22 | 54.17 | 180.56 |
| Shop/Shed | 40' x 80' | 0.00 | 2.50 | 2.38 | 2.08 | 6.96 |

| Table 4. Estimated Cost of Each Operation with Power-Unit. | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | -- Machine Costs -- | | |
| Operation | Power Unit | Miles per Hour | Acres per Hour | Labor Cost per Acre | Variable Cost per Acre | Fixed Cost per Acre | Total Cost per Acre |
| Bed Shaper | Tractor - 125 hp 4WD | 2.00 | 4.07 | $4.91 | $4.72 | $28.69 | $38.31 |
| Chisel | Tractor - 200 hp 4WD | 3.50 | 5.35 | 3.74 | 7.52 | 17.87 | 29.13 |
| Cultivator | Tractor - 175 hp 4WD | 3.00 | 3.49 | 5.73 | 6.96 | 25.01 | 37.70 |
| Planter - 4 Row | Tractor - 225 hp 4WD | 3.00 | 2.62 | 7.64 | 15.94 | 67.97 | 91.55 |
| Digger 2 Row | Tractor - 200 hp 4WD | 2.00 | 1.02 | 19.64 | 53.72 | 108.27 | 181.64 |
| Ripper | Tractor - 150 hp 4WD | 3.50 | 5.35 | 3.74 | 5.11 | 19.57 | 28.42 |
| Disc | Tractor - 225 hp 4WD | 4.50 | 7.36 | 2.72 | 5.15 | 15.04 | 22.91 |
| Roller - Flat | Tractor - 75 hp 4WD | 4.00 | 4.66 | 4.30 | 2.42 | 14.52 | 21.24 |
| Rototiller | Tractor - 200 hp 4WD | 1.20 | 1.63 | 12.28 | 24.06 | 66.91 | 103.25 |

**Table 5. Estimated Per Acre Returns Over Cash Costs at Varying Yields and Prices.**

| | Cwt per Acre | | | | | | |
|---|---|---|---|---|---|---|---|
| **Price/Cwt** | **375.0** | **400.0** | **425.0** | **450.0** | **475.0** | **500.0** | **525.0** |
| **$11.06** | ($925) | ($649) | ($372) | ($96) | $180 | $457 | $733 |
| **$11.56** | ($738) | ($449) | ($160) | $129 | $418 | $707 | $996 |
| **$12.06** | ($550) | ($249) | $53 | $354 | $655 | $957 | $1,258 |
| **$12.56** | ($363) | ($49) | $265 | $579 | $893 | $1,207 | $1,521 |
| **$13.06** | ($175) | $151 | $478 | $804 | $1,130 | $1,457 | $1,783 |
| **$13.56** | $12 | $351 | $690 | $1,029 | $1,368 | $1,707 | $2,046 |
| **$14.06** | $200 | $551 | $903 | $1,254 | $1,605 | $1,957 | $2,308 |

**Table 6. Estimated Per Acre Returns Over Total Costs at Varying Yields and Prices.**

| | Cwt per Acre | | | | | | |
|---|---|---|---|---|---|---|---|
| **Price/Cwt** | **375.0** | **400.0** | **425.0** | **450.0** | **475.0** | **500.0** | **525.0** |
| **$11.06** | ($2,007) | ($1,731) | ($1,454) | ($1,178) | ($901) | ($625) | ($348) |
| **$11.56** | ($1,820) | ($1,531) | ($1,242) | ($953) | ($664) | ($375) | ($86) |
| **$12.06** | ($1,632) | ($1,331) | ($1,029) | ($728) | ($426) | ($125) | $177 |
| **$12.56** | ($1,445) | ($1,131) | ($817) | ($503) | ($189) | $125 | $439 |
| **$13.06** | ($1,257) | ($931) | ($604) | ($278) | $49 | $375 | $702 |
| **$13.56** | ($1,070) | ($731) | ($392) | ($53) | $286 | $625 | $964 |
| **$14.06** | ($882) | ($531) | ($179) | $172 | $524 | $875 | $1,227 |