

2006 Cost of Potato Production Comparisons for Idaho Commercial Potato Production

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2006 Cost of Potato Production
Comparisons for Idaho
Commercial Potato Production

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Costs of Potato Production In Idaho

The overall goal of this project is to provide the Idaho potato industry with annual estimates of potato production costs in Idaho by region. Production costs will be compared both within and between regions on a per acre and a per hundredweight basis. Percentage changes in the major cost categories from the most recent previous year will also be calculated.

The following objectives are designed to meet the project goal:

1. To collect data from input suppliers, machinery and equipment dealers, and growers as appropriate.
2. To revise existing potato costs and returns estimates to reflect current input costs and growers' production practices.
3. To develop cost of production estimates for new varieties or production systems as appropriate, or as requested.
4. To provide individual CAR estimates to the Idaho potato industry and University of Idaho faculty with potato responsibility.
5. To calculate change in production costs by region and make this information available to the Idaho potato industry.
6. To re-establish the Cost of Production Advisory Committee and to meet with this group to review the potato CAR estimates and to obtain input on proposed revisions.

I would like to acknowledge the cooperation and support that I receive from all segments of the Idaho potato industry, including growers, processors, and input suppliers. I would also like to thank the Idaho Potato Commission for the funding I receive to support this project, BDK902.

Cost of Production Background

The University of Idaho Department of Agricultural Economics and Rural Sociology (AERS) develops crop costs and returns (CAR) estimates – also referred to as enterprise budgets or cost of production estimates -- for many of the major crops grown in Idaho. CAR estimates are revised and published every other year in odd-numbered years, typically in the early winter. Crop CAR estimates are developed for four geographic regions of the state. These include southwestern Idaho, southcentral Idaho, eastern Idaho, and northern Idaho. Climate and soil conditions not only influence which crops are produced in each region of the state, but they also influence the crop specific production practices in each region. Production

practices, even for the same crop, can and do vary significantly by region. Production practices depicted in the University of Idaho CAR estimates are typical or representative for that crop and region. They are not averages. The relatively small sample size of growers that provide data does not allow us to make statistical inferences for the state or even a region. It is also important to note that while the production practices and costs presented in the CAR estimates are representative of a region, there is a wide range in production practices and costs.

Information used in developing production practices modeled in the CAR estimates comes from a variety of sources, including: surveys of individual growers, information from grower panels, industry fieldmen, as well as University of Idaho county Extension educators and production specialists. Both crop and livestock CAR estimates are available from the Internet at the following URL: <http://www.ag.uidaho.edu/aers> Click on Resources and then Crops or Livestock.

2006 Crop Input Costs

The cost information used to produce the 2006 potato CAR estimates came from the summary of data collected from various input supplier surveys that was published as Agricultural Economics Extension Series no. 06-04, *Idaho Crop Input Price Summary for 2006*. This is available upon request or a copy can be obtained at the Internet URL shown above.

Surveys were conducted between June and September and included irrigation districts and canal companies, agricultural lenders, crop insurance companies, trucking companies, aerial and other custom applicators, and chemical and fertilizer dealers. Information on seed potato prices and the cost to cut and treat potato seed was taken from a survey of Idaho seed potato growers. A charge for handling and transportation is added then added to the FOB seed farm-based seed potato prices to derive a seed potato cost for each region.

Machinery and equipment prices were obtained from a survey of dealers conducted between August 2004 and May of 2005. These prices are adjusted using the USDA Prices Paid Machinery Index. Irrigation equipment prices and costs were based on Extension Bulletin 788, *Economics of Sprinkler Irrigation Systems: handline, solid set & wheelline*, and Extension Bulletin 787, *Economics of Low-Pressure Sprinkler Irrigation Systems: center pivot and linear move*. Irrigation system costs were also adjusted using the USDA Prices Paid Machinery Index. Index-based price adjustments are based on changes from July of the base year to July of the current year.

The last major survey of potato growers in each of the three production regions was conducted in February and March 2000. Information from these surveys was used to revise the existing potato CAR estimates, along with spot surveys in 2003 and 2005 to update pest management practices.

Potato Cost of Production Overview

Cost of production estimates are influenced by the assumptions made in depicting a representative or typical farm. The size of the farm and the acreage planted to different crops will influence the costs, particularly machinery ownership costs. It is important to recognize this when making comparisons between regions where assumptions differ, or within a region over time as the underlying assumptions change. The University of Idaho currently has eleven potato CAR estimates. Ten are for commercial potato production and one is for seed production. A list of CAR estimates by region and variety is found in Table 1. Table 1 also indicates whether the CAR estimates include storage or fumigation costs.

Farm Size and Potato Acreage

Table 2 shows the farm size and potato acreage for each region's model farm for the five most recent years when cost of production estimates were made. The model farm in southwestern Idaho is 1,000 acres with 250 acres in potatoes, while the model farms for southcentral and eastern Idaho are 1,500 acres with 375 acres and 500 acres in potatoes, respectively. In general, operating costs are not influenced by farm size. However, ownership costs do change with farm size, primarily because of economies of size and scale with equipment. Equipment ownership costs per acre are strongly influenced by the number of acres that these costs are spread over. The more acres, the lower the cost. In setting the farm size and selecting the machinery compliment, we attempt to achieve an economically efficient combination. Equipment that is under utilized has high ownership costs, while equipment with too many hours of use results in unrealistically low ownership costs.

Input Costs

Price data collected for use in the crop CAR estimates is published as an Agricultural Economics and Rural Sociology Departmental publication. The most recent version of this publication and input price summaries from earlier years are available on the Internet at the URL given on page one. In addition to the prices, the publication also discusses data collection procedures.

Certain input values used in CAR estimates are standardized for the entire state since they don't vary consistently by region. Table 3 contains information on three such items, interest rates, labor costs and Idaho Power's irrigation power charges. Interest is charged from the time an expenditure is made until the harvest month using the operating interest rate shown in Table 3. Operating interest is identified as a separate line item in the CAR estimates. The intermediate interest rate is used in calculating non-cash machinery costs. The labor used in crop production falls in one of three classes shown in Table 3. The labor used to operate machinery; tractor operators and truck drivers for example, receive a higher wage than unskilled (other) labor used during harvest to pick clods and rocks on a harvester and to help with storage and trans-loading operations. The labor costs include the base wage rate plus payroll taxes and benefit costs. These are shown as a percentage. Additional labor information is included in the background and assumptions page that accompanies each CAR estimate. While Idaho Power's service area does not extend to all irrigated areas of southern Idaho, it is by far the largest supplier of power to farms. The power rates shown in Table 3 are used with a center pivot irrigation system to derive the cost per acre-inch of water applied. The power demand is for pressurization only. The standard assumption for each model farm is that surface water is delivered to the farm from a canal.

Tables 4-a, 4-b and 4-c contain cost information on common inputs that generally vary by region. These include fuel, water assessment, and fertilizer. Table 4-a shows these costs for southwestern Idaho, Table 4-b shows the costs for southcentral Idaho and Table 4-c shows the costs for eastern Idaho. Prior to 1999, a state average price was used in all the CAR estimates for diesel and gasoline.

Potato Yields

The yield in a CAR estimate is used to calculate gross revenue and break-even prices needed to cover costs in different categories. Yield is also the basis for certain costs, such as promotion or inspection fees paid by growers. Yield also drives storage and transloading costs which are calculated on a hundredweight basis. Table 5 shows the potato yields that have been used in the commercial potato CAR estimates published by the University of Idaho for each region for the last five updates. Some values are shown only as a reference and indicate the value we would use if we published a CAR estimate for that area and with those production practices. Only those shown in bold type are used in CAR estimates.

Prior to 1991 there was not a consistent method used to determine potato yields in CAR estimates for all three regions. Starting in 1991, yields in all three regions were based Idaho Agricultural Statistics Service county-level yield data. From 1991 to 1995, the yield was calculated using a 5-year rolling average. From 1995 through 2003 the yields used in the potato CAR estimates were based on a projected

yield using exponential smoothing with an alpha value of .20. This procedure eliminated the negative bias that resulted from using historical data to calculate averages when yields were increasing rapidly. Unfortunately, exponential smoothing also produced projected yields that varied widely from actual yield when potato yield variation from one year to the next was substantial. To avoid this problem, yield estimates for CAR estimates was switched to a projected 3-year average starting in 2005. The yields for years one and two are from IASS published data. For 2006 this would be yield data from 2004 and 2005. The third year is a forecast yield for the current year, 2006. The forecast yield is calculated by multiplying the previous year's yield (the latest published county-level data from IASS) by the percentage change in Idaho's potato yield for the current year (2006) based on the November yields from IASS. The yield forecast for southwestern Idaho uses the southwestern Idaho yield data and the yield forecast for southcentral and eastern Idaho are based on the "other counties." County-level yields for 2006 will not be published by USDA until September 2007. Yields used in the CAR estimates are rounded to the nearest 5 hundredweight. These base area yields are then adjusted to account for fumigation, a procedure described later.

For crop reporting purposes, the IASS breaks Idaho into regions. The IASS calculates potato yields both for individual counties within a region and for the region itself. The yield estimates used in southwestern and southcentral Idaho CAR estimates are based on the IASS regions and includes all the counties in that region. Prior to 2001, yields in eastern Idaho CAR estimates were based on four major commercial potato counties: Bannock, Bingham, Bonneville and Power. Starting in 2001, separate CAR estimates were made for commercial potato production in the southern counties, Bannock, Bingham and Power, and the northern counties: Bonneville, Jefferson and Madison. (See Table 1.)

The 2005 yield data shown in Tables 6 and 7 is the most recent county and regional yield data available from USDA. Table 6 shows the regional, and in the case of eastern Idaho, the sub regional potato yields for the three most recent years available, as well as a 3-year average and a 3-year projected yield average. These values are not rounded to the nearest 5 hundredweight. Yield changes from 2005 to 2006 are shown below. These percentage changes are used to forecast a yield for 2006. This forecasted yield for 2006 is then used with the published data for 2004 and 2005 to calculate a projected 3-year average.

<u>Area</u>	<u>2005 Yield</u>	<u>2006 Yield</u>	<u>Percentage Change</u>
All Idaho Counties	366	371	1.4%
10 SW Counties	470	470	0%
Other Areas	359	365	1.7%

Because of changes in how yields were calculated and other procedural changes, it can be difficult to make historical comparisons going back more than one year. When procedural changes occur, the previous year's CAR estimate is re-calculated using the new procedure so that the year-to-year change is not biased. However, the resulting costs for the previous year will be different than those published for that year. The 2006 southwest Idaho Russet Burbank CAR estimate uses the fumigated yield of 500 cwt and the 2006 Shepody CAR estimate uses a fumigated yield of 480 cwt. These yields are unchanged from those used in the 2005 CAR estimates. For southcentral Idaho, the non-fumigated yield in the 2006 CAR estimates is 390 cwt and the fumigated yield is 440. Both increased by 10 cwt compared to 2005 CAR estimates. The yield for the 2006 eastern Idaho north district budget without fumigation increased by 10 cwt, from 320 to 330. There is no CAR estimate that includes fumigation for the north district. The yields used in the eastern Idaho south district CAR estimates also increased by 10 cwt. The yield for non-fumigated CAR estimates is 350 and for the fumigated CAR estimate, the yield is 390. The following section explains how the yield values used in the fumigation and non-fumigation CAR estimates are derived.

Fumigation Yield and Cost Dilemma

Fumigation has a significant impact on the per acre production costs and can also have a large impact on potato yield and quality. For an individual grower, this does not pose a problem because the cost and yield increases correspond. In the budgeting procedures used to generate the potato CAR estimates, the cost increase is not a problem when fumigation is included. There are, however, two yield questions that must be considered. The first question: how much of a yield increase should be attributed to fumigation? The second question: what should the base yield in the non-fumigation CAR estimate be? Since the county and regional yields published by IASS contain both fumigated and non-fumigated potato acreage, the IASS values are not appropriate for either a CAR estimate with fumigation or one without fumigation unless some attempt is made to identify and separate the fumigation yield impact in the IASS data.

Historic yields based on IASS data are too low if used in a CAR estimate with the full cost of fumigation included. Historic yields are too high if used in a CAR estimate when no fumigation cost is included. Including only a partial cost for fumigation would be appropriate in calculating average production costs, but not for calculating typical costs where fumigation would be in or out. In addition, the methods used by the University of Idaho to obtain farmer production practice data is not consistent with calculating average production costs for a region. Using the IASS yield data and including a partial fumigation cost in a typical budget is not appropriate as it gives the appearance that fumigation is less expensive than it actually is.

The IASS county-level or regional yield data were used to derive an area yield. These procedures were discussed in the previous section. This base area yield value is set equal to the weighted average of the fumigated yield and the non-fumigated yield as shown in the following formula. The weights are the estimated percentage of potato acres in that region that are fumigated and not fumigated, respectively. The yield adjustment attributable to fumigation as well as the percentage of acres fumigated in each region is shown in Table 8.

Fumigation Yield Adjustment Factor

$$(\% \text{ of acres not fumigated} \times Y) + (\% \text{ acres fumigated} \times FY) = \text{Area Average Yield},$$

Where Y = non-fumigation yield, FY = fumigation yield, , and
 FY = Y + fumigation yield adjustment

The following example illustrates how the fumigation adjustment factor was used, given an area yield of 3400 cwt, with 60 percent of the potato acreage fumigated and a fumigation yield adjustment of 50 hundredweight per acre. Set up the equation as shown below and solve for Y.

$$.40Y + .60(Y+50) = 400$$

$$1.0 Y + 30 = 400$$

$$Y = 370$$

$$\text{And } FY = 420$$

$$\text{Check: } .40 \times 370 + .60 \times 420 = 400$$

Fumigation yield in this example is 420 and non-fumigation yield is 370. The fumigation CAR estimate would include the full cost of fumigation and the non-fumigation would have no fumigation costs. Thus, the costs and yields would correspond.

Note: There are limitations to this type of adjustment and there is a lack of publicly available data on which to base fumigation estimates. While not perfect, using this methodology does reduce the previous negative bias that occurred when calculating costs per hundredweight when the benefit of fumigation on yield was included in the region or county yields, but the cost of fumigation was not. Comments from the potato industry on how to improve this procedure are encouraged, particularly on how to improve the values shown in Table 8. Using the percentages of acres fumigated from Table 8 and the number of potato acres grown in each region produces a statewide weighted-average of approximately 39 percent of the potato acreage being fumigated. This falls within the ranges of values of 35-40 percent given by a knowledgeable industry source.

Unresolved Yield Issue

Regardless of how the area potato yields are calculated, how does this yield compare to the grower's paid yield? The answer will vary depending on whether the potatoes are sold in the fresh or in the process market. The yield data from IASS includes all tubers greater than 1-1/2 inches. Since the UI CAR estimates do not segment the yield into components that would sell for different prices, the breakeven prices shown in the CAR estimates are what the grower would have to average in order to cover costs. The implicit assumption is that the yields shown in the CAR estimates are a paid yield. But with unuseables averaging around 8 percent for processing potatoes, the yield shown in the UI CAR estimates is greater than what growers would be paid on. This issue may not be resolved in the CAR estimates, but it certainly needs to be addressed if the potato industry uses the values in these CAR estimates to justify contract base prices and incentives. The underlying issue is whether per acre cost and cost changes from year-to-year is a better measure to use than cost per hundredweight and their change from year-to-year.

2006 Cost of Potato Production Overview and Comparison

Direct comparisons with previously published estimates should not be made without accounting for differences in procedures and assumptions. Procedural adjustments made in several calculations between 2005 and 2006. These are discussed later.

Note that beginning with the 2003 CAR estimates, the non-storage CAR estimates model a situation where potatoes are trans-loaded to a semi-trailer, rather than being hauled directly to the plant or processor storage in field trucks, which was the assumption prior to 2003. The semi-trailer is hired, not owned. The expense shows up on the CAR estimates as a custom hauling charge. The labor costs for the crew at the transloading point must also be accounted for. The assumption is that the transloading crew is the same as the “cellar” crew used when potatoes are placed in storage. The transloading labor is included in the trans-loading operating expense, not as a labor charge per se. There is also an ownership cost in the non-storage CAR estimates to account for depreciation, interest and insurance on the trans-loading equipment. The trans-loading equipment includes most but not all the equipment that is used in the storage CAR estimates and includes: conveyers, even-flow bin, eliminator/sizer, and piler. Information regarding the specific farm situation for each CAR estimate, i.e. farm size, tillage, cultivation, fertilization practices, irrigation method, etc., is discussed on the background and assumptions page that is included with each CAR estimate.

Cost Summaries

Tables 9, 10 and 11 summarize the 2006 commercial potato CAR estimates for southwestern, southcentral and eastern Idaho, respectively. Only the southern county Russet Burbank CAR estimates for eastern Idaho are shown in Table 11. To simplify the comparison, input costs are summarized by category. The detailed costs are shown in the appendix. Most input categories contain multiple items. Table 9 (southwestern Idaho) shows the cost summaries for a Russet Burbank and a Shepody CAR estimate. Both use fumigation and neither contains storage costs, but both contain trans-loading costs. Table 9 (southcentral Idaho—Magic Valley) shows the cost summaries for three Russet Burbank CAR estimates. There is a non-storage and a storage CAR estimate, neither with fumigation, and a storage CAR estimate with fumigation. The non-storage CAR estimate includes trans-loading costs. Table 10 (eastern Idaho - South) shows the cost summaries for three Russet Burbank CAR estimates for the southern portion of eastern Idaho commercial growing area. There is a non-storage (with trans-loading costs) and a storage CAR estimate, neither with fumigation, and a storage CAR estimate with fumigation.

Table 12 summarizes the 2006 operating and ownership costs, both per acre and per hundredweight for all the CAR estimates shown in Tables 9, 10 and 11, as well as the eastern Idaho north district commercial CAR estimate and the G3 seed CAR estimate. Making cost comparisons between regions may not always be appropriate because of difference in the assumed management practices and farm sizes. Management

practices for southcentral and southeastern Idaho are fairly similar, making direct comparisons more meaningful.

Cost Comparisons

Table 13 shows the major cost categories (operating, ownership and total) for 2005 and 2006, and the change in costs between years on a per acre basis by CAR estimate for each region. Table 14 shows the same cost categories and changes, but on a per hundredweight basis. The cost data summarized in Tables 13 and 14 is taken from tables 15-22, which are found in the appendix. Operating costs per acre increases ranged from \$116 to \$168 per acre. Ownership cost increases ranged from \$38 to \$69 per acre. Total cost per acre increases ranged from \$153 to \$237. Operating cost changes per hundredweight ranged from \$.24 to \$.31, ownership costs per hundredweight increases ranged from \$.06 to \$.12 and the total cost per hundredweight increases ranged from \$.30 to \$.43.

Tables 15-24 contain the detail 2006 CAR estimates with a comparison to 2005, showing both the dollar change and the percentage change in costs for the major cost categories as well as for individual items. Table 15 and Table 16 contain the southwestern Idaho potato cost of production for Russet Burbank and Shepody, respectively. Tables 17, 18 and 19 contain the three southcentral Idaho Russet Burbank cost of production estimates. Tables 20, 21 and 22 contain the eastern Idaho Russet Burbank cost of production estimates for the southern district (Bannock, Bingham and Power counties). Table 23 contains the eastern Idaho north district (Bonneville, Jefferson and Madison counties) commercial potato cost of production estimate and Table 24 contains the G3 seed potato cost of production estimate. Changes are color-coded, blue indicates an increase and red indicates a decrease. Costs that were affected by a procedural change are shown in a green font.

While overall costs increased between 2005 and 2006, there were exceptions. The price of several pesticides dropped between 2005 and 2006. The biggest price drops were on some herbicides used extensively on potato, but the cost of some insecticides and fungicides also declined. This put the 2006 pesticide cost category at or below 2005 for all CAR estimates, except the eastern Idaho storage budget with fumigation. An increase in the price of Vapam more than offset the other pesticide cost savings. The only other major cost category that showed a decline between 2005 and 2006 was irrigation. The drop in the energy component in Idaho Power rates more than offset the increase in other costs in this category. (See table 3 for Idaho Power rate information.) Seed prices increased dramatically. Russet Burbank seed increased between 25 and 30 percent. Shepody seed costs were up by 16 percent. The cost to cut and treat seed also increased by \$.10 per hundredweight, or 6.5%. After seed, the second biggest dollar increase per

acre came from fuel, which added \$25-30 per acre to production costs. Fuel and lubricants had the second biggest percentage change of all the major cost categories, running between 31 and 36 percent. Diesel fuel prices increased ranged between \$.61 and \$.75 per gallon. Operating interest showed the biggest percentage increase, ranging from 35.9% to 40.9% Farmers were paying interest rates two percentage points higher than 2005 and they were borrowing more money to cover increased operating expenses.

Adjustments for 2006

The most significant change made in cost calculations involved potato storage and transloading. Rather than having the budget generator program calculate the ownership costs for transloading equipment, potato handling equipment and potato storages, these costs are now calculated externally and entered directly as an expense item. These expenses will be much easier to identify and it avoids some expense category inconsistencies. In addition, the assumption about the equipment used in a transloading operation was changed. Up until this year (2006), the same potato handling equipment used at the potato storage facility was also used to generate repair costs and ownership costs for the non-storage potato budgets where the potatoes are transloaded. But since a typical transloading operation does not use all the conveyers used when potatoes are placed in storage, the resulting ownership and repair costs for transloading were not accurate. Transloading equipment repairs and ownership costs for 2005 shown in the comparison tables were recalculated using the new procedures and using last year's equipment values. That's why the 2005 values are shown in green. They differ from the values shown for 2005 in last year's report. Because the budget generator program is no longer being used to calculate costs for storage and transloading equipment, the insurance value calculated by the program for 2006 no longer includes the transloading equipment, handling equipment and storages. A revised equipment insurance cost for 2005 was generated to provide an unbiased cost to compare with the 2006 insurance costs. The insurance cost of the transloading equipment, handling equipment and storages is included in the ownership costs shown in each table.

Another 2006 change involved potato budgets using sulfuric acid to desiccate vines. Starting this year, the cost of applying sulfuric acid and the cost of the sulfuric acid will be shown separately. Previously, this was shown as a single per acre charge that was included in either the Custom and Consultant expense category or the Pesticides and Chemical expense category in other budgets. This expense will not be handled consistently between budgets. This change does not so much change the total costs, but more accurately shows the expense in the appropriate category. The 2005 budget was modified to match this change but uses 2005 values.

Table 1. Idaho potato costs and returns estimates by region.

Region/Publication No.	Variety	Storage	Fumigation
<u>Commercial Potatoes</u>			
Southwestern:			
EBB2-Po1-06	Russet Burbank	No	Yes
EBB2-Po2-06	Shepody	No	Yes
Southcentral:			
EBB3-Po1-06	Russet Burbank	No	No
EBB3-Po2-06	Russet Burbank	Yes	No
EBB3-Po3-06	Russet Burbank	Yes	Yes
Eastern – South Counties:			
EBB4-Po1-06	Russet Burbank	No	No
EBB4-Po5-06	Russet Burbank	Yes	No
EBB4-Po6-06	Russet Burbank	Yes	Yes
EBB4-Po3-06	Chipping	Yes	No
Eastern – North Counties:			
EBB4-Po2-06	Russet Burbank	Yes	No
<u>Seed</u>			
Eastern – Seed Counties			
EBB4-Po4-06	G3 Russet Burbank	Yes	No

Table 2. Model farm size and potato acreage assumptions by region: 2001, and 2003- 2006.

	<u>2001</u>		<u>2003</u>		<u>2004</u>		<u>2005</u>		<u>2006</u>	
	Farm	Potato	Farm	Farm	Farm	Potato	Farm	Potato	Farm	Potato
Southwestern	1000	250	1000	1000	1000	250	1000	250	1000	250
Southcentral	1500	375	1500	1500	1500	375	1500	375	1500	375
Eastern	1500	500	1500	1500	1500	500	1500	500	1500	500

Note: No potato cost of production estimates were produced in 2002.

Table 3. Interest rates, labor charges and power rates used in CAR estimates: 2001, and 2003-2006.

	2001	2003	2004	2005	2006
Operating Interest Rate	7.5%	5.5%	6.0%	7.5%	9.50%
Intermediate Interest Rate	8.0%	5.75%	6.5%	7.75%	8.75%
<u>Labor Class (overhead)</u>					
Machinery Labor (30%)	\$11.70	\$12.00	\$12.15	\$13.15	\$13.45
Irrigation Labor (25%)	\$7.80	\$8.05	\$8.15	\$8.75	\$9.00
Other Labor (15%)	\$6.90	\$7.15	\$7.20	\$7.70	\$7.95
Power Rates: Idaho Power Irrigation Service Schedule 24					
Monthly Service Charge	\$10.07	\$10.07	\$12.00	\$12.00	\$14.25
Demand Charge: irrigation season	\$3.58	\$3.58	\$ 4.02	\$ 4.19	\$4.36
Base Rate: per kWh	2.841¢	2.8416¢	3.2618¢	3.4897¢	3.3964¢
Power Cost Adjustment per kWh	1.3415¢	1.3159¢	0.5054¢	0.6052¢	-0.36989¢
Effective Rate: per kWh	4.1831¢	4.1575¢	3.7672¢	4.0949¢	3.0275¢
Pumping Cost per Acre Inch		\$1.37	\$1.26	\$1.39	\$1.12

Note: Labor overhead applied to machinery labor and other labor base wages prior to 2001 were 35% and 20%, respectively.

Pumping cost is calculated using Idaho Power Company rates for a 160-acre center pivot with a corner system, 69% pumping plant efficiency and with zero lift. Pumping costs per acre-inch at different lifts (0-, 100-, 200- and 300-feet) and different irrigation systems (center pivots without corner systems and wheellines) can be found in the *Idaho Crop Input Cost Summary for 2006*.

Table 4-a. Current and historical fuel, water assessment and fertilizer component prices for southwestern Idaho: 2001, and 2003- 2006.

	2001	2003	2004	2005	2006
Gasoline	\$1.60	\$1.70	\$2.08	\$2.37	\$2.98
Off-Road Diesel	\$1.00	\$1.17	\$1.58	\$2.09	\$2.75
Road Diesel					\$3.26
Water Assessment	\$31.65	\$36.05	\$33.60	\$34.45	\$35.90
Dry Nitrogen (46-0-0)	\$0.32	\$0.28	\$0.32	\$0.42	\$0.45
Liquid Nitrogen (32-0-0)	\$0.34	\$0.31	\$0.35	\$0.47	\$0.48
P ₂ O ₅ Dry (11-52-0)*	\$0.22	\$0.21	\$0.22	\$0.24	\$0.27
P ₂ O ₅ Liquid (10-34-0)*	\$0.38	\$0.32	\$0.35	\$0.33	\$0.36
K ₂ O (0-0-60)	\$0.16	\$0.13	\$0.16	\$0.22	\$0.24
Sulfur	\$0.15	\$0.12	\$0.12	\$0.16	\$0.18

*Nitrogen in 11-52-0 and 10-34—0 was valued at the price of N in urea and Solution 32, respectively.

Table 4-b. Current and historical fuel, water assessment and component fertilizer prices for southcentral Idaho: 2001, and 2003- 2006.

	2001	2003	2004	2005	2006
Gasoline	\$1.54	\$1.65	\$2.04	\$2.26	\$2.97
Off-Road Diesel	\$1.07	\$1.25	\$1.50	\$2.07	\$2.82
Road Diesel					\$3.31
Water Assessment	\$24.70	\$26.40	\$27.20	\$30.20	\$33.95
Pre-Plant N (46-0-0)	\$0.31	\$0.30	\$0.29	\$0.39	\$0.38
Post Plant N (32-0-0)	\$0.32	\$0.33	\$0.35	\$0.45	\$0.44
P ₂ O ₅ Dry (11-52-0)*	\$0.19	\$0.20	\$0.21	\$0.23	\$0.28
P ₂ O ₅ Liquid (10-34-0)*	\$0.32	\$0.31	\$0.33	\$0.31	\$0.37
K ₂ O (0-0-60)	\$0.15	\$0.15	\$0.16	\$0.22	\$0.25
Sulfur	\$0.13	\$0.12	\$0.13	\$0.14	\$0.17

*Nitrogen in 11-52-0 and 10-34—0 was valued at the price of N in urea and Solution 32, respectively.

Table 4-c. Current and historical fuel, water assessment and fertilizer component prices for eastern Idaho: 2001, and 2003-2006.

	2001	2003	2004	2005	2006
Gasoline	\$1.51	\$1.60	\$2.01	\$2.29	\$2.89
Diesel	\$1.07	\$1.18	\$1.44	\$2.08	\$2.79
Water Assessment	\$10.30	\$11.65	\$13.05	\$12.40	\$12.95
E. Idaho South District		\$19.50	\$25.00	\$21.00	\$23.00
E. Idaho North District		\$9.50	\$9.10	\$9.50	\$9.55
Pre-Plant N (46-0-0)	\$0.33	\$0.29	\$0.30	\$0.39	\$0.40
Post Plant N (32-0-0)	\$0.36	\$0.32	\$0.34	\$0.43	\$0.43
P ₂ O ₅ Dry (11-52-0)*	\$0.20	\$0.20	\$0.22	\$0.24	\$0.25
P ₂ O ₅ Liquid (10-34-0)*	\$0.32	\$0.28	\$0.27	\$0.28	\$0.30
K ₂ O (0-0-60)	\$0.17	\$0.14	\$0.16	\$0.21	\$0.23
Sulfur	\$0.10	\$0.12	\$0.12	\$0.12	\$0.15

*Nitrogen in 11-52-0 and 10-34—0 was valued at the price of N in urea and Solution 32, respectively.

Table 5. Calculated potato yields used in published University of Idaho costs and returns estimates by region, both with and without fumigation: 2001, 2003, 2004 and 2006. *

Area	2001	2003	2004	2005	2006
	cwt	cwt	cwt	cwt	cwt
<u>Southwest Region: Base Yield</u>	485	455	470	475	475
Russet Burbank: No Fumigation	450	420	435	440	440
Russet Burbank: Fumigation	510	480	495	500	500
Shepody: No Fumigation:	425	400	415	420	420
Shepody: Fumigation	485	460	475	480	480
<u>Southcentral Region: Base Yield</u>	410	405	405	400	415
Russet Burbank: No Fumigation	390	380	385	380	390
Russet Burbank: Fumigation	440	430	435	430	440
<u>Eastern Region: Russet Burbank: Base</u>	330	325	330	320	345
South Counties* : Base Yield	355	335	340	355	370
South: No Fumigation	345	320	325	340	350
South: Fumigation	385	360	365	380	390
North Counties*: Base Yield	315	325	325	325	340
North: No Fumigation	310	315	315	320	330
North: Fumigation	340	345	345	350	360

Note: Values in bold indicate published CAR estimates. There are no published CAR estimates for those not in bold. These are shown only for comparison.

*Eastern Idaho North Counties: Bonneville, Jefferson and Madison.

*Eastern Idaho South Counties: Bannock, Bingham and Power.

Table 6. Historical potato yields published by IASS or calculated from IASS data for 2003-2005, historical 3-year averages, projected 2006 yield and 3-year averages using projected 2006 yield and historic yields for 2004 and 2005.

Area	2003	2004	2005	3-Year Average	Projected 2006	3-Year Projected Average
Southwest Region	465	490	470	475	470	477
Southcentral Region	390	413	410	404	417	413
Eastern Region	314	345	340	333	346	344
South District	326	371	364	354	370	368
North District	310	334	338	327	344	339
Statewide	344	374	366	361	371	370

IASS: Idaho Agricultural Statistics Service, USDA.

The 3-year projected average is based on 2004, 2005 and the projected 2006 yields.

Table 7. Potato yields reported by IASS for the primary commercial potato counties in eastern Idaho for 2003-2005, and 3-year average.

Area	2003	2004	2005	3-Year Average	Projected 2006	3-Year Projected Average
<u>North District Counties:</u>						
Bonneville	286	303	310	300	315	309
Jefferson	333	380	385	366	392	386
Madison	310	320	319	316	324	321
3-county Average	310	334	338	327	344	339
<u>South District Counties:</u>						
Bannock	310	360	377	349	383	373
Bingham	325	370	346	347	352	356
Power	344	382	369	365	375	375
3-county Average	326	371	364	354	370	368

IASS: Idaho Agricultural Statistics Service, USDA.

Blue is forecast or average based on forecast.

Table 8. Fumigation percentage by region and yield adjustment factors by region.

Region	Acres Fumigated	Fumigation Adjustment
Southwest	60%	+ 60 cwt
Southcentral	45%	+ 50 cwt
Southeastern		
South District	40%	+ 40 cwt
North District	25%	+ 30 cwt

Table 9. 2006 Commercial non-storage potato cost of production summary for southwestern Idaho with fumigation.

	R. Burbank	Shepody
Seed - cut & treated	\$267.95	\$341.55
Fertilizer	\$299.70	\$243.60
Pesticides *	\$365.03	\$382.54
Custom & Consultants	\$166.00	\$161.80
Irrigation **	\$104.68	\$102.47
Other Costs ***	\$106.00	\$103.20
Transloading Operating Costs	\$ 40.00	\$ 38.40
Fuel & Lube	\$ 127.15	\$127.15
Machinery Repairs	\$ 45.28	\$ 45.57
Transloading Equipment Repairs	\$ 5.45	\$ 5.45
Labor: Machine & Non-Machine	\$130.80	\$130.80
Operating Interest	\$ 71.72	\$ 73.44
Total Operating Cost	\$1,729.75	\$1,755.97
Per CWT Operating Costs	\$3.46	\$3.66
Equipment Insurance	\$ 6.26	\$ 6.30
Transloading Equip. Ownership Costs	\$ 66.00	\$ 66.00
Equipment Ownership Cost	\$258.57	\$260.43
Land Charge ****	\$435.00	\$435.00
Overhead	\$ 43.00	\$ 43.00
Management Fee	\$123.00	\$123.00
Total Ownership Cost	\$931.83	\$933.73
Per CWT Ownership Costs	\$1.86	\$1.95
Total Cost*****	\$2,661.58	\$2,689.70
Per CWT Total Costs	\$5.32	\$5.60
Yield	500	480

* Pesticide costs include insecticides, herbicides, fungicides and fumigant.

** Irrigation includes power, labor and water assessment.

*** Other costs include crop insurance and assessment fees.

**** Land charge includes irrigation system ownership costs.

*****Total Cost does not include risk.

Table 10. 2006 Commercial Russet Burbank potato cost of production summary for Southcentral Idaho.

	Non-Fumigated		Fumigated
	Non-Storage	Storage	Storage
Seed - cut & treated	\$256.45	\$256.45	\$256.45
Fertilizer	\$276.30	\$276.30	\$292.60
Pesticides *	\$155.93	\$155.93	\$301.93
Custom & Consultants	\$159.45	\$ 77.55	\$104.55
Irrigation **	\$ 94.95	\$ 94.95	\$ 98.80
Other Costs ***	\$ 92.60	\$89.94	\$ 95.52
Transloading Operating Costs	\$ 31.20		
Storage Operating Costs		\$237.90	\$268.40
Fuel & Lube	\$ 96.63	\$ 97.21	\$ 99.20
Machinery Repairs	\$ 40.85	\$ 41.71	\$ 44.80
Transloading Equip. Repairs	\$ 6.30		
Storage & Storage Equip. Repairs		\$15.30	\$ 16.65
Labor: Machine & Non-Machine	\$112.86	\$112.59	\$123.15
Operating Interest	\$ 49.51	\$ 46.12	\$ 62.32
Total Operating Cost	\$1,373.03	\$1,501.95	\$1,765.37
Per CWT Operating Costs	\$3.52	\$3.85	\$4.01
Equipment Insurance	\$ 3.93	\$ 3.80	\$ 3.93
Transloading or Handling			
Equipment Ownership Costs	\$ 44.00	\$ 55.00	\$ 55.00
Storage Facility Ownership Costs		\$ 103.00	\$ 116.00
Equipment Ownership Cost	\$162.66	\$157.52	\$162.61
Land Charge ****	\$375.00	\$375.00	\$375.00
Overhead	\$ 34.00	\$ 36.00	\$ 43.00
Management Fee	\$ 93.00	\$ 98.00	\$110.00
Total Ownership Cost	\$712.59	\$828.32	\$865.54
Per CWT Ownership Costs	\$1.83	\$2.12	\$1.97
Total Cost*****	\$2,085.62	\$2,330.27	\$2,630.91
Per CWT Total Costs	\$5.35	\$5.98	\$5.98
Yield	390	390	440

* Pesticide costs include insecticides, herbicides, fungicides and fumigant.

** Irrigation includes power, labor and water assessment.

*** Other costs include crop insurance and assessment fees.

**** Land charge includes irrigation system ownership costs.

*****Total Cost does not include risk.

Table 11. 2006 Commercial Russet Burbank potato cost of production summary for Eastern Idaho, southern counties.

	Non-Fumigated		Fumigated
	Non-Storage	Storage	Storage
Seed - cut & treated	\$217.35	\$217.35	\$217.35
Fertilizer	\$245.45	\$245.45	\$258.55
Pesticides *	\$102.38	\$102.38	\$258.38
Custom & Consultants	\$121.85	\$48.35	\$ 48.35
Irrigation **	\$ 75.45	\$75.45	\$ 80.41
Other Costs ***	\$ 81.00	\$78.62	\$ 83.94
Transloading Operating Costs	\$ 28.00		
Storage Operating Costs		\$213.50	\$237.90
Fuel & Lube	\$110.78	\$109.64	\$109.64
Machinery Repairs	\$ 40.99	\$ 41.63	\$ 41.63
Transloading Equip. Repairs	\$ 7.40		
Storage & Storage Equip. Repairs		\$ 13.65	\$ 14.70
Labor: Machine & Non-Machine	\$112.47	\$113.82	\$115.64
Operating Interest	\$ 40.50	\$ 39.27	\$55.09
Total Operating Cost	\$1,183.62	\$1,299.10	\$1,521.58
Per CWT Operating Costs	\$3.38	\$3.71	\$3.90
Equipment Insurance	\$ 4.18	\$ 4.14	\$ 4.14
Transloading or Storage Equipment Ownership Costs	\$33.00	\$ 41.00	\$ 41.00
Storage Facility Ownership Costs		\$ 92.00	\$103.00
Equipment Ownership Cost	\$175.82	\$174.57	\$174.57
Land Charge ****	\$270.00	\$270.00	\$270.00
Overhead	\$ 29.00	\$31.00	\$ 37.00
Management Fee	\$ 84.00	\$88.00	\$ 98.00
Total Ownership Cost	\$596.00	\$700.71	\$727.71
Per CWT Ownership Costs	\$1.70	\$2.00	\$1.87
Total Cost*****	\$1,779.62	\$1,999.81	\$2,249.29
Per CWT Total Costs	\$5.08	\$5.71	\$5.77
Yield	350	350	390

* Pesticide costs include insecticides, herbicides, fungicides and fumigant.

** Irrigation includes power, labor and water assessment.

*** Other costs include crop insurance and assessment fees.

**** Land charge includes irrigation system ownership costs.

*****Total Cost does not include risk.

Table 12. 2006 Idaho potato costs per acre and per cwt summary by region.

CAR Estimate	Operating Cost		Ownership Costs		Total Cost	
	Acre	Cwt	Acre	Cwt	Acre	Cwt
<u>Southwestern Idaho:</u>						
Russet Burbank: No Storage & Fumigation	\$1,730	\$3.46	\$932	\$1.86	\$2,662	\$5.32
Shepody: No Storage & Fumigation	\$1,756	\$3.66	\$934	\$1.95	\$2,690	\$5.60
<u>Southcentral Idaho:</u>						
Russet Burbank: No Storage	\$1,373	\$3.52	\$713	\$1.83	\$2,086	\$5.35
Russet Burbank: Storage	\$1,502	\$3.85	\$828	\$2.12	\$2,330	\$5.98
Russet Burbank: Storage & Fumigation	\$1,765	\$4.01	\$866	\$1.97	\$2,631	\$5.98
<u>Eastern Idaho: South</u>						
Russet Burbank: No Storage	\$1,184	\$3.38	\$596	\$1.70	\$1,780	\$5.08
Russet Burbank: Storage	\$1,299	\$3.71	\$701	\$2.00	\$2,000	\$5.71
Russet Burbank: Storage & Fumigation	\$1,522	\$3.90	\$728	\$1.87	\$2,249	\$5.77
<u>Eastern Idaho: North</u>						
Russet Burbank: Storage	\$1,192	\$3.61	\$649	\$1.97	\$1,841	\$5.58
Russet Burbank G3 Seed	\$1,297	\$4.85	\$626	\$2.38	\$1,923	\$7.23

Note: the cost per cwt for seed are calculated after subtracting the proportionate share of the revenue from seed tops from the operating (75%), ownership (25%) or total (100%) costs per acre. The adjusted cost is divided by the seed yield, not the total yield. This is a change in procedure from previous years.

Table 13. Cost changes per acre from 2005 to 2006, by region.

	Southwestern Idaho		Southcentral Idaho			Eastern Idaho-South		
	R. Burbank: No Storage	Shepody: No Storage	R. Burbank: No Storage	R. Burbank: Storage	R. Burbank: Fum. & Stor.	R. Burbank: No Storage	R. Burbank: Storage	R. Burbank: Fum. & Stor.
2005 Op. Cost	\$1,578	\$1,608	\$1,240	\$1,343	\$1,597	\$1,068	\$1,160	\$1,363
2006 Op. Cost	\$1,730	\$1,756	\$1,373	\$1,502	\$1,765	\$1,184	\$1,299	\$1,522
Change	\$152	\$148	\$133	\$159	\$168	\$116	\$139	\$159
2005 Own. Cost	\$879	\$881	\$660	\$763	\$797	\$558	\$652	\$678
2006 Own. Cost	\$932	\$934	\$713	\$828	\$866	\$596	\$701	\$728
Change	\$53	\$53	\$53	\$65	\$69	\$38	\$49	\$50
2005 Total Cost	\$2,457	\$2,489	\$1,900	\$2,106	\$2,394	\$1,626	\$1,812	\$2,041
2006 Total Cost	\$2,662	\$2,690	\$2,086	\$2,330	\$2,631	\$1,780	\$2,000	\$2,249
Change	\$204	\$201	\$186	\$224	\$237	\$153	\$188	\$209

Note: rounded values may not add up.

Op. = Operating and Own. = Ownership

Table 14. Cost changes per cwt from 2005 to 2006, by region.

	Southwestern Idaho		Southcentral Idaho			Eastern Idaho-South		
	R. Burbank: No Storage	Shepody: No Storage	R. Burbank: No Storage	R. Burbank: Storage	R. Burbank: Fum. & Stor.	R. Burbank: No Storage	R. Burbank: Storage	R. Burbank: Fum. & Stor.
2005 Op. Cost	\$3.16	\$3.35	\$3.26	\$3.53	\$3.71	\$3.14	\$3.41	\$3.59
2006 Op. Cost	\$3.46	\$3.66	\$3.52	\$3.85	\$4.01	\$3.38	\$3.71	\$3.90
Change	\$0.30	\$0.31	\$0.26	\$0.32	\$0.30	\$0.24	\$0.30	\$0.31
2005 Own. Cost	\$1.76	\$1.84	\$1.74	\$2.01	\$1.85	\$1.64	\$1.92	\$1.78
2006 Own. Cost	\$1.86	\$1.95	\$1.83	\$2.12	\$1.97	\$1.70	\$2.00	\$1.87
Change	\$0.11	\$0.11	\$0.09	\$0.12	\$0.11	\$0.06	\$0.09	\$0.08
2005 Total Cost	\$4.91	\$5.18	\$5.00	\$5.54	\$5.57	\$4.78	\$5.33	\$5.37
2006 Total Cost	\$5.32	\$5.60	\$5.35	\$5.98	\$5.98	\$5.08	\$5.71	\$5.77
Change	\$0.41	\$0.42	\$0.35	\$0.43	\$0.41	\$0.30	\$0.38	\$0.40

Note: rounded values may not add up.

Op. = Operating and Own. = Ownership

Appendix

EBB2-Po1-06

Southwestern Idaho Russet Burbank Commercial Potatoes: Fumigation and No Storage

Economic costs are used in the University of Idaho costs and returns estimates. All resources are valued based on market price or opportunity cost. Input prices are based on the U of I's annual survey of agricultural supply companies. Except for contract crops, the selling price is a 10-year average. The costs and returns estimate shown here is typical for growing irrigated Russet Burbank commercial potatoes in southwestern Idaho when ground is fumigated. Production practices are based on producer surveys conducted in Canyon, Elmore, Owyhee and Payette counties. 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 quality of management are all crucial factors that influence costs.

The Model Farm

This costs and returns estimate models a 1,000-acre farm with 250 acres in potatoes. In addition to potatoes, the farm grows 250 acres of corn, 150 acres of alfalfa seed, 250 acres of grain, and 100 acres of dry beans. The farm uses a center pivot irrigation system and surface water delivered from an irrigation district. The irrigation district charges a flat fee per acre for water. Irrigation power costs are for pressurization only and are based on current Idaho Power rates.

Tillage, Fertilization, Pest Control, and Irrigation

After the stubble from the preceding grain crop is chopped, the potato ground is irrigated, disked, ripped twice, disked a second time and fumigated in the fall. In April the ground is marked-out and then planted using two 4-row planters with 36-inch row spacing. The seeding rate is 22 hundredweight (cwt) per acre with an additional 5 percent (1 cwt) included to account for waste. Potatoes are cultivated twice in May. The second cultivation is with a basin tillage tool. In September potato vines are rolled and sprayed with a desiccant. Potatoes harvest begins three weeks later using a 2-row harvester, a 2-row windrower, and four 10-wheeler trucks. Potatoes are hauled from the field to a central location where they are transloaded into a semi trailer and transported to the processor by a custom hauler. Most fertilizer is custom applied in two preplant applications, one in the fall before fumigation and one in the spring before planting. A starter fertilizer containing nitrogen, phosphate, and micronutrients is applied at mark-out. Additional nitrogen is applied postplant through the irrigation system. The weed program uses cultural, mechanical (tillage and cultivation), and herbicidal control methods. Two postemergence herbicides are used for control of annual grasses and broadleaf weeds. The first herbicide is applied with the second cultivation. The second herbicide is applied

by chemigation. For insect control, a systemic insecticide is banded at planting, and two contact insecticides are applied by air. Four fungicide applications are made for blight control, starting in late June. Two applications are made by custom air spray while two are made by chemigation. Potatoes receive 24 inches of water during the growing season from approximately 55 irrigations (pivot revolutions), 3 inches in May, 7 inches in June, 9 inches in July, and 5 inches in August. Two inches of water is applied before fall tillage and another three inches are used to apply/incorporate the fumigant. One inch of water is applied prior to harvest. These off-growing season applications are also credited to potatoes for a total of 30 inches.

Resources: Machinery, Land, Labor, and Capital

Table 3 lists the tractors, trucks, and other equipment used to produce potatoes, along with their operating and ownership costs. Transloading equipment is not listed. All machinery except trucks is valued at 75 percent of replacement cost new prices shown in Table 3., adjusted for price changes using USDA's Farm Machinery Prices Paid Index. This adjustment reduces the machinery repair operating cost and the depreciation and interest ownership costs on equipment by 25 percent. The truck's price includes the cost of a used truck and 75 percent of the cost of a new self-unloading bed. The land charge is cash rent and covers the ownership costs (depreciation, interest, and insurance) of the irrigation system. A machinery labor charge is made for all field operations except those performed on a custom basis. Custom operations are listed separately. The non-machine labor accounts for extra planting and harvest labor. Labor to operate machinery is valued at \$13.45 per hour, while irrigation and non-machine labor are valued at \$9.00 and \$7.95, respectively. Labor rates include a base wage plus a percentage for Social Security, Medicare, unemployment insurance, and other labor overhead expenses. Labor overhead amounts to 15 percent for non-machine labor, 25 percent for irrigation labor, and 30 percent for machinery labor. A management fee, 5 percent of gross returns, is included as an ownership cost. Interest on operating capital is charged from the time an input is applied until the month of harvest and calculated at a nominal rate of 9.5 percent. Interest on intermediate term capital is calculated using a rate of 8.75 percent. An overhead charge of 2.5 percent of operating expenses is included to cover unallocated whole-farm costs such as office expenses, legal and accounting fees, and 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 includes soil and petiole sampling and irrigation scheduling.

Table 15. 2006 Irrigated Russet Burbank Commercial Potatoes: Fumigation and No Storage, Southwestern Idaho. Comparison with 2005.

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre	2005	\$ Change	% Change
Gross Returns					500	0	0.0%
Potatoes	500	cwt	\$4.90	\$2,450.00			
Operating Inputs					2005	\$ Change	% Change
Seed:					\$219.65	\$48.30	22.0%
G-3 Potato Seed	23	cwt	\$10.00	\$230.00	\$184.00	\$46.00	25.0%
Seed Cut and Treat	23	cwt	\$1.65	\$37.95	\$35.65	\$2.30	6.5%
Fertilizer:					\$278.85	\$20.85	7.5%
Dry Nitrogen - Preplant	160	lb	\$0.45	\$72.00	\$67.20	\$4.80	7.1%
Dry P2O5	190	lb	\$0.27	\$51.30	\$45.60	\$5.70	12.5%
K2O	180	lb	\$0.24	\$43.20	\$39.60	\$3.60	9.1%
Sulfur	80	lb	\$0.18	\$14.40	\$12.80	\$1.60	12.5%
Micronutrients	2	ac	\$13.50	\$27.00	\$25.00	\$2.00	8.0%
Liquid Nitrogen	150	lb	\$0.48	\$72.00	\$70.50	\$1.50	2.1%
Liquid P2O5	55	lb	\$0.36	\$19.80	\$18.15	\$1.65	9.1%
Pesticides:					\$369.52	-\$4.49	-1.2%
Vapam	50	gal	\$3.60	\$180.00	\$177.50	\$2.50	1.4%
Thimet 20G	15	lb	\$2.40	\$36.00	\$35.25	\$0.75	2.1%
Sencor DF	0.75	lb	\$13.65	\$10.24	\$15.30	-\$5.06	-33.1%
Eptam 7EC	2.0	qt	\$6.40	\$12.80	\$17.30	-\$4.50	-26.0%
Dithane F45 Rainshield	3.2	qt	\$3.90	\$12.48	\$12.16	\$0.32	2.6%
Ridomil Gold/Bravo	2.0	lb	\$18.00	\$36.00	\$36.00	\$0.00	0.0%
Amistar	2.5	oz	\$5.55	\$13.88	\$13.50	\$0.38	2.8%
Monitor 4E	0.75	qt	\$23.55	\$17.66	\$18.56	-\$0.90	-4.8%
Bravo Weather Stik	0.66	qt	\$11.15	\$7.36	\$7.49	-\$0.13	-1.7%
Fulfill	2.75	oz	\$5.95	\$16.36	\$15.26	\$1.10	7.2%
Reglone	1	qt	\$22.25	\$22.25	\$21.20	\$1.05	5.0%
Custom & Consultants:					\$144.30	\$21.70	15.0%
Custom Fertilize	2	ac	\$6.90	\$13.80	\$13.80	\$0.00	0.0%
Consultant	1	ac	\$16.00	\$16.00	\$15.00	\$1.00	6.7%
Custom Air Spray-10G	3	ac	\$10.40	\$31.20	\$25.50	\$5.70	22.4%
Custom Hauling	500	cwt	\$0.21	\$105.00	\$90.00	\$15.00	16.7%
Irrigation:					\$110.76	-\$6.08	-5.5%
Water Assessment	1	ac	\$35.95	\$35.95	\$34.45	\$1.50	4.4%
Irrigation Power-CP	30	acin	\$1.12	\$33.60	\$41.70	-\$8.10	-19.4%
Irrigation Repairs	30	acin	\$0.55	\$16.50	\$16.50	\$0.00	0.0%
Irrigation Labor-CP	2.07	hr	\$9.00	\$18.63	\$18.11	\$0.52	2.9%
Other:					\$130.00	\$16.00	12.3%
Fees & Assessments	500	cwt	\$0.14	\$70.00	\$65.00	\$5.00	7.7%
Crop Insurance	1	ac	\$36.00	\$36.00	\$30.00	\$6.00	20.0%
Transloading Costs	500	cwt	\$0.08	\$40.00	\$35.00	\$5.00	14.3%
Fuel & Lubricants					\$96.83	\$30.32	31.3%
Machinery Repairs				\$45.28	\$43.11	\$2.17	5.0%
Transloading Equipment Repairs				\$5.45	\$5.20	\$0.25	4.8%
Machinery Labor	7.78	hrs	\$13.45	\$104.64	\$102.31	\$2.33	2.3%
Other Labor	3.29	hrs	\$7.95	\$26.16	\$25.33	\$0.83	3.3%
Operating Interest				\$71.72	\$52.39	\$19.33	36.9%
Total Operating Costs				\$1,729.75	\$1,578.25	\$151.50	9.6%
Operating Costs per Unit				\$3.46	\$3.16	\$0.30	9.6%
Net Returns Above Operating Expenses					\$746.75	-\$26.50	

Table 15. 2006 Irrigated Russet Burbank Commercial Potatoes: Fumigation and No Storage, Southwestern Idaho. Comparison with 2005.

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre			
Ownership Costs:							
Tractors & Equipment Insurance			\$6.26		\$6.07	\$0.19	3.1%
Transloading Equipment			\$66.00		\$62.75	\$3.25	5.2%
Tractors & Equipment Depreciation & Interest			\$258.57		\$227.29	\$31.28	13.8%
Irrigation Equipment Depreciation & Interest							
Land *			\$435.00		\$425.00	\$10.00	2.4%
Overhead			\$43.00		\$39.00	\$4.00	10.3%
Management Fee			\$123.00		\$119.00	\$4.00	3.4%
Total Ownership Costs			\$931.83		\$879.11	\$52.72	6.0%
Ownership Costs per Unit			\$1.86		\$1.76	\$0.11	6.0%
Total Costs per Acre			\$2,661.58		\$2,457.36	\$204.22	8.3%
Total Cost per Unit			\$5.32		\$4.91	\$0.41	8.3%
Returns to Risk					-\$132.36	-\$79.22	
Notes:							
* Includes irrigation system ownership costs.							
Blue font indicates an increase.							
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	+				
	5%		5%				
		Yield					
<u>Price</u>	475	500	525				
Operating Cost Breakeven	\$3.64	\$3.46	\$3.29				
Ownership Cost Breakeven	\$1.96	\$1.86	\$1.77				
Total Cost Breakeven	\$5.60	\$5.32	\$5.07				
		Price					
<u>Yield</u>	\$4.66	\$4.90	\$5.15				
Operating Cost Breakeven	371.6	353.0	336.2				
Ownership Cost Breakeven	200.2	190.2	181.1				
Total Cost Breakeven	571.8	543.2	517.3				

EBB2-Po2-06

Southwestern Idaho Shepody Commercial Potatoes: Fumigation and No Storage

Economic costs are used in the University of Idaho costs and returns estimates. All resources are valued based on market price or opportunity cost. Input prices are based on the U of I's annual survey of agricultural supply companies. Except for contract crops, the selling price is a 10-year average. The costs and returns estimate shown here is typical for growing irrigated Shepody commercial potatoes in southwestern Idaho when ground is fumigated. Production practices are based on producer surveys conducted in Canyon, Elmore, Owyhee and Payette counties. 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 quality of management are all crucial factors that influence costs.

The Model Farm

This costs and returns estimate models a 1,000-acre farm with 250 acres in potatoes. In addition to potatoes, the farm grows 250 acres of corn, 150 acres of alfalfa seed, 250 acres of grain, and 100 acres of dry beans. The farm uses a center pivot irrigation system and surface water delivered from an irrigation district. The irrigation district charges a flat fee per acre for water. Irrigation power costs are for pressurization only and are based on current Idaho Power rates.

Tillage, Fertilization, Pest Control, and Irrigation

After the stubble from the preceding grain crop is chopped, the potato ground is irrigated, disked, ripped twice, disked a second time and fumigated in the fall. In April the ground is marked-out and then planted using two 4-row planters with 36-inch row spacing. The seeding rate is 26 hundredweight (cwt) per acre with an additional 5 percent (1 cwt) included to account for waste. Potatoes are cultivated twice in May. The second cultivation is with a basin tillage tool. In September potatoes are harvested using a 2-row harvester, a 2-row windrower, and four 10-wheeler trucks. Potatoes are hauled from the field to a central location where they are transloaded into a semi trailer and transported to the processor by a custom hauler. Most fertilizer is custom applied in two preplant applications, one in the fall before fumigation and one in the spring before planting. A starter fertilizer containing nitrogen, phosphate, and micronutrients is applied at mark-out. Additional nitrogen is applied postplant through the irrigation system. The weed program uses cultural, mechanical (tillage and cultivation), and herbicidal control methods. Two postemergence herbicide applications are made to control annual grasses and broadleaf weeds. The first, a two-way tank mix, is applied with the second cultivation. The second herbicide application is made by chemigation. For insect

control, a systemic insecticide is banded at planting, and two contact insecticides are applied by air. Four fungicide applications are made for blight control, starting in late June. Two applications are made by custom air spray while two are made by chemigation. Potatoes receive 24 inches of water during the growing season from approximately 55 irrigations (pivot revolutions), 3 inches in May, 7 inches in June, 9 inches in July, and 5 inches in August. Two inches of water is applied before fall tillage and another three inches are used to apply/incorporate the fumigant. These off-growing season applications are also credited to potatoes for a total of 29 inches.

Resources: Machinery, Land, Labor, and Capital

Table 3 lists the tractors, trucks, and other equipment used to produce potatoes, along with their operating and ownership costs. Transloading equipment is not listed. All machinery except trucks is valued at 75 percent of replacement cost new prices shown in Table 3, adjusted for price changes using USDA's Farm Machinery Prices Paid Index. This adjustment reduces the machinery repair operating cost and the depreciation and interest ownership costs on equipment by 25 percent. The truck's price includes the cost of a used truck and 75 percent of the cost of a new self-unloading bed. The land charge is cash rent and covers the ownership costs (depreciation, interest, and insurance) of the irrigation system. A machinery labor charge is made for all field operations except those performed on a custom basis. Custom operations are listed separately. The non-machine labor accounts for extra planting and harvest labor. Labor to operate machinery is valued at \$13.45 per hour, while irrigation and non-machine labor are valued at \$9.00 and \$7.95, respectively. Labor rates include a base wage plus a percentage for Social Security, Medicare, unemployment insurance, and other labor overhead expenses. Labor overhead amounts to 15 percent for non-machine labor, 25 percent for irrigation labor, and 30 percent for machinery labor. A management fee, 5 percent of gross returns, is included as an ownership cost. Interest on operating capital is charged from the time an input is applied until the month of harvest and calculated at a nominal rate of 9.5 percent. Interest on intermediate term capital is calculated using a rate of 8.75 percent. An overhead charge of 2.5 percent of operating expenses is included to cover unallocated whole-farm costs such as office expenses, legal and accounting fees, and 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 includes soil and petiole sampling and irrigation scheduling.

Table 16. 2006 Irrigated Shepody Commercial Potatoes: With Fumigation and No Storage, Southwestern Idaho. Comparison With 2005.

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre			
Gross Returns							
Potatoes	480	cwt	\$5.00	\$2,400.00	480	0	0.0%
Operating Inputs					2005	\$ Change	% Change
Seed:				\$341.55	\$297.00	\$44.55	15.0%
G-3 Shepody Potato Seed	27	cwt	\$11.00	\$297.00	\$255.15	\$41.85	16.4%
Seed Cut and Treat	27	cwt	\$1.65	\$44.55	\$41.85	\$2.70	6.5%
Fertilizer:				\$243.60	\$225.95	\$17.65	7.8%
Dry Nitrogen - Preplant	145	lb	\$0.45	\$65.25	\$60.90	\$4.35	7.1%
Dry P2O5	145	lb	\$0.27	\$39.15	\$34.80	\$4.35	12.5%
K2O	160	lb	\$0.24	\$38.40	\$35.20	\$3.20	9.1%
Sulfur	60	lb	\$0.18	\$10.80	\$9.60	\$1.20	12.5%
Micronutrients	2	ac	\$13.50	\$27.00	\$25.00	\$2.00	8.0%
Liquid Nitrogen	90	lb	\$0.48	\$43.20	\$42.30	\$0.90	2.1%
Liquid P2O5	55	lb	\$0.36	\$19.80	\$18.15	\$1.65	9.1%
Pesticides:				\$382.54	\$382.67	-\$0.13	0.0%
Vapam	50	gal	\$3.60	\$180.00	\$177.50	\$2.50	1.4%
Thimet 20G	15	lb	\$2.40	\$36.00	\$35.25	\$0.75	2.1%
Treflan 4 HFP	0.5	qt	\$5.60	\$2.80	\$3.50	-\$0.70	-20.0%
Dual Magnum	1.0	qt	\$24.95	\$24.95	\$24.95	\$0.00	0.0%
Eptam 7EC	2.0	qt	\$6.40	\$12.80	\$17.30	-\$4.50	-26.0%
Dithane F45 Rainshieldc	3.2	qt	\$3.90	\$12.48	\$12.16	\$0.32	2.6%
Ridomil Gold/Bravo	2.0	lb	\$18.00	\$36.00	\$36.00	\$0.00	0.0%
Amistar	2.5	oz	\$5.55	\$13.88	\$13.50	\$0.38	2.8%
Monitor 4E	0.75	qt	\$23.55	\$17.66	\$18.56	-\$0.90	-4.8%
Bravo Weather Stik	0.66	lb	\$11.15	\$7.36	\$7.49	-\$0.13	-1.7%
Fulfill	2.75	oz	\$5.95	\$16.36	\$15.26	\$1.10	7.2%
Reglone	1.0	qt	\$22.25	\$22.25	\$21.20	\$1.05	5.0%
Custom & Consultants:				\$161.80	\$140.70	\$21.10	15.0%
Custom Fertilize	2	ac	\$6.90	\$13.80	\$13.80	\$0.00	0.0%
Consultant	1	ac	\$16.00	\$16.00	\$15.00	\$1.00	6.7%
Custom Air Spray-10G	3	ac	\$10.40	\$31.20	\$25.50	\$5.70	22.4%
Custom Hauling	480	cwt	\$0.21	\$100.80	\$86.40	\$14.40	16.7%
Irrigation:				\$102.47	\$108.30	-\$5.83	-5.4%
Water Assessment	1	ac	\$35.95	\$35.95	\$34.45	\$1.50	4.4%
Irrigation Power-CP	29	acin	\$1.12	\$32.48	\$40.31	-\$7.83	-19.4%
Irrigation Repairs	29	acin	\$0.55	\$15.95	\$15.95	\$0.00	0.0%
Irrigation Labor-CP	2.01	hr	\$9.00	\$18.09	\$17.59	\$0.50	2.8%
Other:				\$141.60	\$126.00	\$15.60	12.4%
Fees & Assessments	480	cwt	\$0.14	\$67.20	\$62.40	\$4.80	7.7%
Crop Insurance	1	ac	\$36.00	\$36.00	\$30.00	\$6.00	20.0%
Transloading Costs	480	cwt	\$0.08	\$38.40	\$33.60	\$4.80	14.3%
Fuel & Lubricants				\$127.15	\$96.83	\$30.32	31.3%
Machinery Repairs				\$45.57	\$43.39	\$2.18	5.0%
Transloading Equipment Repairs				\$5.45	\$5.20	\$0.25	4.8%
Machinery Labor	7.78	hrs	\$13.45	\$104.64	\$102.31	\$2.33	2.3%
Other Labor	3.29	hrs	\$7.95	\$26.16	\$25.33	\$0.83	3.3%
Operating Interest				\$73.44	\$53.88	\$19.56	36.3%
Total Operating Costs				\$1,755.97	\$1,607.56	\$148.41	9.2%
Operating Costs per Unit				\$3.66	\$3.35	\$0.31	9.2%
Net Returns Above Operating Expenses				\$644.03	\$696.19	-\$52.16	

Table 16. 2006 Irrigated Shepody Commercial Potatoes: With Fumigation and No Storage, Southwestern Idaho. Comparison With 2005.

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre			
Ownership Costs:							
Tractors & Equipment Insurance				\$6.30	\$6.49	-\$0.19	-2.9%
Transloading Equipment				\$66.00	\$62.75	\$3.25	5.2%
Tractors & Equipment Depreciation & Interest				\$260.43	\$228.92	\$31.51	13.8%
Irrigation Equipment Depreciation & Interest							
Land *				\$435.00	\$425.00	\$10.00	2.4%
Overhead				\$43.00	\$40.00	\$3.00	7.5%
Management Fee				\$123.00	\$118.00	\$5.00	4.2%
Total Ownership Costs				\$933.73	\$881.16	\$52.57	6.0%
Ownership Costs per Unit				\$1.95	\$1.84	\$0.11	6.0%
Total Costs per Acre				\$2,689.70	\$2,488.72	\$200.98	8.1%
Total Cost per Unit				\$5.60	\$5.18	\$0.42	8.1%
Returns to Risk				-\$289.70	-\$184.97	-\$104.73	
Notes:							
* Includes irrigation system ownership costs.							
Blue font indicates an increase.							
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	+				
	5%		5%				
		Yield					
<u>Price</u>	456	480	504				
Operating Cost Breakeven	\$3.85	\$3.66	\$3.48				
Ownership Cost Breakeven	\$2.05	\$1.95	\$1.85				
Total Cost Breakeven	\$5.90	\$5.60	\$5.34				
		Price					
<u>Yield</u>	\$4.75	\$5.00	\$5.25				
Operating Cost Breakeven	369.7	351.2	334.5				
Ownership Cost Breakeven	196.6	186.7	177.9				
Total Cost Breakeven	566.3	537.9	512.3				

EBB3-Po1-06

Southcentral Idaho Russet Burbank Commercial Potatoes: No Storage and No Fumigation

Economic costs are used in the University of Idaho costs and returns estimates. All resources are valued based on market price or opportunity cost. Input prices are based on the U of I's annual survey of agricultural supply companies. Except for contract crops, the selling price is a 10-year average. The costs and returns estimate shown here is typical for growing irrigated Russet Burbank commercial potatoes in southcentral Idaho. Production practices are based on producer surveys conducted in Cassia, Gooding, Jerome, Minidoka and Twin Falls counties. Although production practices may be similar for individual farms, each 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 quality of management are all crucial factors that influence costs.

The Model Farm

This costs and returns estimate models a 1,500-acre farm with 375 acres in potatoes. In addition to potatoes, the farm also grows 375 acres of sugarbeets and 750 acres of grain. Corn or dry beans may substitute for grain. The farm uses a center pivot irrigation system and surface water delivered to the farm from an irrigation district. The district charges a flat fee per acre for water. Irrigation power costs are for pressurization only and are based on current Idaho Power rates.

Tillage, Fertilization, Pest Control, and Irrigation

After the stubble from the preceding grain crop is chopped, the potato ground is irrigated, disked twice and ripped in the fall, then chisel plowed and marked-out in the spring. Potatoes are planted in late April or early May using a 6-row planter with a 36-inch row spacing. The seeding rate is 22 hundredweight (cwt), with an additional 5 percent (1 cwt) added to account for waste. Potatoes are cultivated once in May after emergence with a basin tillage tool. In September, vines are rolled and sprayed with sulfuric acid. Potato harvest begins 3 weeks later using a 2-row harvester, 4-row windrower, and five 10-wheeler trucks (300 cwt capacity). Potatoes are hauled from the field to a central location where they are transloaded into a semi trailer and transported to the processor by a custom hauler. Most fertilizer is custom applied in split preplant applications, fall and spring. A liquid starter fertilizer and micronutrients are applied at mark-out. Additional nitrogen is applied postplant through the irrigation system. The weed program uses cultural, mechanical (tillage and cultivation) and herbicidal control methods. A two-way herbicide tank mix is applied at cultivation to control annual grasses and broadleaf weeds. A third herbicide is applied by chemigation during May. For insect control, a systemic insecticide is banded at planting, and contact insecticides are applied twice by air, once in July and once in August. Three fungicide

applications are made for blight control, starting in early July. All applications are made by a custom aerial applicator. Potatoes receive 23.5 inches of water during the growing season from approximately 55 irrigations (pivot revolutions), 1 inch in May, 5 inches in June, 9.5 inches in July, and 8 inches in August. One additional inch of water is applied before harvest in September and 2 inches of water applied to the grain stubble before fall tillage are also credited to potatoes, for a total of 26.5 inches.

Resources: Machinery, Land, Labor, and Capital

Table 3 lists the tractors, trucks, and other equipment used for potato production, their operating and ownership costs. Transloading equipment is not listed. All machinery except trucks is valued at 75 percent of replacement cost new, adjusted for price changes using USDA's Farm Machinery Prices Paid Index. This adjustment reduces the machine repair operating cost and the depreciation and interest ownership costs on equipment by 25 percent. The truck's price includes the cost of a used truck and a new self-unloading bed. The land charge is cash rent and covers the ownership costs (depreciation, interest, and insurance) on the irrigation system. A machine labor charge is made for all field operations except those performed on a custom basis. Custom operations are listed separately. The non-machine labor accounts for extra planting and harvest labor. Labor to operate machinery is valued at \$13.45 per hour, while irrigation and non-machine labor are valued at \$9.00 and \$7.95, respectively. Labor rates include a base wage plus a percentage for Social Security, Medicare, unemployment insurance, and other labor overhead expenses. Labor overhead amounts to 15 percent for non-machine labor, 25 percent for irrigation labor, and 30 percent for machinery labor. A management fee, 5 percent of gross returns, is included as an ownership cost. Interest on operating capital is charged from the time an input is applied until the month of harvest and is calculated at a nominal rate of 9.5 percent. Interest on intermediate term capital is calculated using a rate of 8.75 percent. A general overhead charge of 2.5 percent of operating expenses is included to cover unallocated whole-farm costs such as office expenses, legal and accounting fees, and 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.

Table 17. 2006 Southcentral Idaho Irrigated Russet Burbank Commercial Potatoes:
No Storage. Comparison With 2005.

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre			
Gross Returns							
Potatoes	390	cwt	\$4.90	\$1,911.00	380	10	2.6%
Operating Inputs							
					2005	\$ Change	% Change
Seed:				\$256.45	\$209.30	\$47.15	22.5%
G-3 Potato Seed	23	cwt	\$9.50	\$218.50	\$173.65	\$44.85	25.8%
Seed Cut and Treat	23	cwt	\$1.65	\$37.95	\$35.65	\$2.30	6.5%
Fertilizer:				\$276.30	\$257.05	\$19.25	7.5%
Dry Nitrogen - Preplant	165	lb	\$0.38	\$62.70	\$64.35	-\$1.65	-2.6%
Dry P2O5	200	lb	\$0.28	\$56.00	\$46.00	\$10.00	21.7%
K2O	180	lb	\$0.25	\$45.00	\$39.60	\$5.40	13.6%
Sulfur	80	lb	\$0.17	\$13.60	\$11.20	\$2.40	21.4%
Micronutrients	2	ac	\$13.50	\$27.00	\$25.00	\$2.00	8.0%
Liquid Nitrogen	130	lb	\$0.44	\$57.20	\$58.50	-\$1.30	-2.2%
Liquid P2O5	40	lb	\$0.37	\$14.80	\$12.40	\$2.40	19.4%
Pesticides:				\$155.93	\$165.81	-\$9.88	-6.0%
Thimet 20G	15	lb	\$2.35	\$35.25	\$35.25	\$0.00	0.0%
Prowl 3.3 EC	1	qt	\$5.80	\$5.80	\$5.95	-\$0.15	-2.5%
Sencor DF	0.75	lb	\$13.60	\$10.20	\$16.69	-\$6.49	-38.9%
Eptam 7E	2.0	qt	\$6.55	\$13.10	\$18.40	-\$5.30	-28.8%
Dithane F45 Rainshield	3.2	qt	\$3.90	\$12.48	\$12.00	\$0.48	4.0%
Bravo Ultrex WDG	2.5	lb	\$7.20	\$18.00	\$17.50	\$0.50	2.9%
Fulfill WDG	2.75	oz	\$6.25	\$17.19	\$17.33	-\$0.14	-0.8%
Monitor 4E	0.75	qt	\$23.55	\$17.66	\$18.94	-\$1.28	-6.7%
Sulfuric Acid	25	gal	\$1.05	\$26.25	\$23.75	\$2.50	10.5%
Custom & Consultants:				\$159.45	\$136.30	\$23.15	17.0%
Custom Fertilize	2	ac	\$6.50	\$13.00	\$11.40	\$1.60	14.0%
Consultant	1	ac	\$16.00	\$16.00	\$15.00	\$1.00	6.7%
Custom Air Spray-10G	4	ac	\$9.90	\$39.60	\$33.00	\$6.60	20.0%
Custom Hauling	390	cwt	\$0.21	\$81.90	\$68.40	\$13.50	19.7%
Sulfuric Acid Application	1	ac	\$8.95	\$8.95	\$8.50	\$0.45	5.3%
Irrigation:				\$94.95	\$97.90	-\$2.95	-3.0%
Water Assessment	1	ac	\$33.95	\$33.95	\$30.20	\$3.75	12.4%
Irrigation Power-CP	26.5	acin	\$1.12	\$29.68	\$36.84	-\$7.16	-19.4%
Irrigation Repairs	26.5	acin	\$0.55	\$14.58	\$14.58	\$0.00	0.0%
Irrigation Labor-CP	1.86	hr	\$9.00	\$16.74	\$16.28	\$0.46	2.8%
Other:				\$123.80	\$112.00	\$11.80	10.5%
Fees & Assessments	390	cwt	\$0.14	\$54.60	\$49.40	\$5.20	10.5%
Crop Insurance	1	ac	\$38.00	\$38.00	\$36.00	\$2.00	5.6%
Transloading Costs	390	cwt	\$0.08	\$31.20	\$26.60	\$4.60	17.3%
Fuel & Lubricants				\$96.63	\$71.22	\$25.41	35.7%
Machinery Repairs				\$40.85	\$38.90	\$1.95	5.0%
Transloading Equipment Repairs				\$6.30	\$6.00	\$0.30	5.0%
Machinery Labor	6.77	hrs	\$13.45	\$91.00	\$88.97	\$2.03	2.3%
Other Labor	2.75	hrs	\$7.95	\$21.86	\$21.18	\$0.68	3.2%
Operating Interest				\$49.51	\$35.13	\$14.38	40.9%
Total Operating Costs				\$1,373.03	\$1,239.76	\$133.27	10.7%
Operating Costs per Unit				\$3.52	\$3.26	\$0.26	7.9%
Net Returns Above Operating Expenses				\$537.97	\$622.24	-\$84.27	

Table 17. 2006 Southcentral Idaho Irrigated Russet Burbank Commercial Potatoes:
No Storage. Comparison With 2005.

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre			
Ownership Costs:							
Tractors & Equipment Insurance				\$3.93	\$3.81	\$0.12	3.1%
Transloading Equipment				\$44.00	\$42.00	\$2.00	4.8%
Tractors & Equipment Depreciation & Interest				\$162.66	\$142.99	\$19.67	13.8%
Irrigation Equipment Depreciation & Interest							
Land *				\$375.00	\$350.00	\$25.00	7.1%
Overhead				\$34.00	\$31.00	\$3.00	9.7%
Management Fee				\$93.00	\$90.00	\$3.00	3.3%
Total Ownership Costs				\$712.59	\$659.80	\$52.79	8.0%
Ownership Costs per Unit				\$1.83	\$1.74	\$0.09	5.2%
Total Costs per Acre				\$2,085.62	\$1,899.56	\$186.06	9.8%
Total Cost per Unit				\$5.35	\$5.00	\$0.35	7.0%
Returns to Risk				-\$174.62	-\$37.56	-\$137.06	
Notes:							
* Includes irrigation system ownership costs.							
Blue font indicates an increase.							
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	+				
	5%		5%				
		Yield					
<u>Price</u>	370.5	390	409.5				
Operating Cost Breakeven	\$3.71	\$3.52	\$3.35				
Ownership Cost Breakeven	\$1.92	\$1.83	\$1.74				
Total Cost Breakeven	\$5.63	\$5.35	\$5.09				
		Price					
<u>Yield</u>	\$4.66	\$4.90	\$5.15				
Operating Cost Breakeven	295.0	280.2	266.9				
Ownership Cost Breakeven	153.1	145.4	138.5				
Total Cost Breakeven	448.0	425.6	405.4				

EBB3-Po2-06

Southcentral Idaho Russet Burbank Commercial Potatoes: On-Farm Storage and No Fumigation

Economic costs are used in the University of Idaho costs and returns estimates. All resources are valued based on market price or opportunity cost. Input prices are based on the U of I's annual survey of agricultural supply companies. Except for contract crops, the selling price is a 10-year average. The costs and returns estimate shown here is typical for growing and storing irrigated Russet Burbank commercial potatoes in southcentral Idaho. Production practices are based on producer surveys conducted in Cassia, Gooding, Jerome, Minidoka and Twin Falls counties. Although production practices may be similar for individual farms, each 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 quality of management are all crucial factors that influence costs.

The Model Farm

This costs and returns estimate models a 1,500-acre farm with 375 acres in potatoes. In addition to potatoes, the farm also grows 375 acres of sugarbeets and 750 acres of grain. Corn or dry beans may substitute for grain. The farm uses a center pivot irrigation system and surface water delivered to the farm from an irrigation district. The district charges a flat fee per acre for water. Irrigation power costs are for pressurization only and are based on current Idaho Power rates.

Tillage, Fertilization, Pest Control, and Irrigation

After the stubble from the preceding grain crop is chopped, the potato ground is irrigated, disked twice and ripped in the fall, then chisel plowed and marked-out in the spring. Potatoes are planted in late April or early May using a 6-row planter with a 36-inch row spacing. The seeding rate is 22 hundredweight (cwt), with an additional 5 percent (1 cwt) added to account for waste. Potatoes are cultivated once in May after emergence with a basin tillage tool. In September, vines are rolled and sprayed with sulfuric acid. Potato harvest begins 3 weeks later using a 2-row harvester, 4-row windrower, and five 10-wheeler trucks (300 cwt capacity). Potatoes are hauled directly to on-farm storage. Potatoes are stored 5 months in a modern, above ground storage facility with air and humidification. In addition to labor, electricity, and sprout inhibitor, storage operating costs include a charge for shrink and interest based on the value of the stored crop. Most fertilizer is custom applied in split preplant applications, fall and spring. A liquid starter fertilizer and micronutrients are applied at mark-out. Additional nitrogen is applied postplant through the irrigation system. The weed program uses cultural, mechanical (tillage and cultivation) and herbicidal control methods. A two-way herbicide tank mix is applied at cultivation to control annual grasses and broadleaf weeds. A third herbicide is

applied by chemigation during May. For insect control, a systemic insecticide is banded at planting, and contact insecticides are applied twice by air, once in July and once in August. Three fungicide applications are made for blight control, starting in early July. All applications are made by a custom aerial applicator. Potatoes receive 23.5 inches of water during the growing season from approximately 55 irrigations (pivot revolutions), 1 inch in May, 5 inches in June, 9.5 inches in July, and 8 inches in August. One additional inch of water is applied before harvest in September and 2 inches of water applied to the grain stubble before fall tillage are also credited to potatoes, for a total of 26.5 inches.

Resources: Machinery, Land, Labor, and Capital

Table 3 lists the tractors, trucks, and other equipment used for potato production, their operating and ownership costs. Storage and handling equipment are not listed. All machinery except trucks is valued at 75 percent of replacement cost new, adjusted for price changes using USDA's Farm Machinery Prices Paid Index. This adjustment reduces the machine repair operating cost and the depreciation and interest ownership costs on equipment by 25 percent. The truck's price includes the cost of a used truck and a new self-unloading bed. The land charge is cash rent and covers the ownership costs (depreciation, interest, and insurance) on the irrigation system. A machine labor charge is made for all field operations except those performed on a custom basis. Custom operations are listed separately. The non-machine labor accounts for extra planting and harvest labor. Labor to operate machinery is valued at \$13.45 per hour, while irrigation and non-machine labor are valued at \$9.00 and \$7.95, respectively. Labor rates include a base wage plus a percentage for Social Security, Medicare, unemployment insurance, and other labor overhead expenses. Labor overhead amounts to 15 percent for non-machine labor, 25 percent for irrigation labor, and 30 percent for machinery labor. A management fee, 5 percent of gross returns, is included as an ownership cost. Interest on operating capital is charged from the time an input is applied until the month of harvest and is calculated at a nominal rate of 7.5 percent. Interest on intermediate term capital is calculated using a rate of 7.75 percent. A general overhead charge of 2.5 percent of operating expenses is included to cover unallocated whole-farm costs such as office expenses, legal and accounting fees, and 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.

Table 18. 2006 Southcentral Idaho Irrigated Russet Burbank Commercial Potatoes: With On-Farm Storage. Comparison With 2005.

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre				
Gross Returns								
Potatoes	390	cwt	\$5.15	\$2,008.50	380	10	2.6%	
Operating Inputs								
					2005	\$ Change	% Change	
Seed:				\$256.45	\$209.30	\$47.15	22.5%	
G-3 Potato Seed	23	cwt	\$9.50	\$218.50	\$173.65	\$44.85	25.8%	
Seed Cut and Treat	23	cwt	\$1.65	\$37.95	\$35.65	\$2.30	6.5%	
Fertilizer:				\$276.30	\$257.05	\$19.25	7.5%	
Dry Nitrogen - Preplant	165	lb	\$0.38	\$62.70	\$64.35	-\$1.65	-2.6%	
Dry P2O5	200	lb	\$0.28	\$56.00	\$46.00	\$10.00	21.7%	
K2O	180	lb	\$0.25	\$45.00	\$39.60	\$5.40	13.6%	
Sulfur	80	lb	\$0.17	\$13.60	\$11.20	\$2.40	21.4%	
Micronutrients	2	ac	\$13.50	\$27.00	\$25.00	\$2.00	8.0%	
Liquid Nitrogen	130	lb	\$0.44	\$57.20	\$58.50	-\$1.30	-2.2%	
Liquid P2O5	40	lb	\$0.37	\$14.80	\$12.40	\$2.40	19.4%	
Pesticides:				\$155.93	\$165.81	-\$9.88	-6.0%	
Thimet 20G	15	lb	\$2.35	\$35.25	\$35.25	\$0.00	0.0%	
Prowl 3.3 EC	1.0	qt	\$5.80	\$5.80	\$5.95	-\$0.15	-2.5%	
Sencor DF	0.75	lb	\$13.60	\$10.20	\$16.69	-\$6.49	-38.9%	
Eptam 7E	2.0	qt	\$6.55	\$13.10	\$18.40	-\$5.30	-28.8%	
Dithane F45 Rainshield	3.2	qt	\$3.90	\$12.48	\$12.00	\$0.48	4.0%	
Bravo Ultrex WDG	2.5	lb	\$7.20	\$18.00	\$17.50	\$0.50	2.9%	
Fulfill WDG	2.75	oz	\$6.25	\$17.19	\$17.33	-\$0.14	-0.8%	
Monitor 4E	0.75	qt	\$23.55	\$17.66	\$18.94	-\$1.28	-6.7%	
Sulfuric Acid	25	gal	\$1.05	\$26.25	\$23.75	\$2.50	10.5%	
Custom & Consultants:				\$77.55	\$67.90	\$9.65	14.2%	
Custom Fertilize	2	ac	\$6.50	\$13.00	\$11.40	\$1.60	14.0%	
Consultant	1	ac	\$16.00	\$16.00	\$15.00	\$1.00	6.7%	
Custom Air Spray-10G	4	ac	\$9.90	\$39.60	\$33.00	\$6.60	20.0%	
Sulfuric Acid Application	1	ac	\$8.95	\$8.95	\$8.50	\$0.45	5.3%	
Irrigation:				\$94.95	\$97.90	-\$2.95	-3.0%	
Water Assessment	1	ac	\$33.95	\$33.95	\$30.20	\$3.75	12.4%	
Irrigation Power-CP	26.5	acin	\$1.12	\$29.68	\$36.84	-\$7.16	-19.4%	
Irrigation Repairs	26.5	acin	\$0.55	\$14.58	\$14.58	\$0.00	0.0%	
Irrigation Labor-CP	1.86	hr	\$9.00	\$16.74	\$16.28	\$0.46	2.8%	
Other:				\$327.84	\$276.73	\$51.11	18.5%	
Fees & Assessments	371	cwt	\$0.14	\$51.94	\$46.93	\$5.01	10.7%	
Crop Insurance	1	ac	\$38.00	\$38.00	\$36.00	\$2.00	5.6%	
Storage Operating Costs	390	cwt	\$0.61	\$237.90	\$193.80	\$44.10	22.8%	
Fuel & Lubricants				\$97.21	\$71.65	\$25.56	35.7%	
Machinery Repairs				\$41.71	\$39.72	\$1.99	5.0%	
Storage Facility & Storage Equipment Repairs				\$15.30	\$14.17	\$1.13	8.0%	
Machinery Labor	6.75	hrs	\$13.45	\$90.73	\$88.71	\$2.02	2.3%	
Other Labor	2.75	hrs	\$7.95	\$21.86	\$21.18	\$0.68	3.2%	
Operating Interest				\$46.12	\$32.93	\$13.19	40.1%	
Total Operating Costs				\$1,501.95	\$1,343.05	\$158.90	11.8%	
Operating Costs per Unit				\$3.85	\$3.53	\$0.32	9.0%	
Net Returns Above Operating Expenses				\$506.55	\$518.95	-\$12.40		

Table 18. 2006 Southcentral Idaho Irrigated Russet Burbank Commercial Potatoes: With On-Farm Storage. Comparison With 2005.

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre			
Ownership Costs:							
Tractors & Equipment Insurance			\$3.80	\$3.80	\$3.69	\$0.11	3.0%
Storage Facilities			\$103.00	\$103.00	\$94.00	\$9.00	9.6%
Potato Handling Equipment			\$55.00	\$55.00	\$51.00	\$4.00	7.8%
Tractors & Equipment Depreciation & Interest			\$157.52	\$157.52	\$138.50	\$19.02	13.7%
Irrigation Equipment Depreciation & Interest							
Land *			\$375.00	\$375.00	\$350.00	\$25.00	7.1%
Overhead			\$36.00	\$36.00	\$33.00	\$3.00	9.1%
Management Fee			\$98.00	\$98.00	\$93.00	\$5.00	5.4%
Total Ownership Costs			\$828.32	\$828.32	\$763.19	\$65.13	8.5%
Ownership Costs per Unit			\$2.12	\$2.12	\$2.01	\$0.12	5.8%
Total Costs per Acre			\$2,330.27	\$2,330.27	\$2,106.24	\$224.03	10.6%
Total Cost per Unit			\$5.98	\$5.98	\$5.54	\$0.43	7.8%
Returns to Risk			-\$321.77	-\$321.77	-\$244.24	-\$77.53	
Notes:							
* Includes irrigation system ownership costs.							
Blue font indicates an increase.							
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	+				
	5%		5%				
		Yield					
Price	370.5	390	409.5				
Operating Cost Breakeven	\$4.05	\$3.85	\$3.67				
Ownership Cost Breakeven	\$2.24	\$2.12	\$2.02				
Total Cost Breakeven	\$6.29	\$5.98	\$5.69				
		Price					
Yield	\$4.89	\$5.15	\$5.41				
Operating Cost Breakeven	307.0	291.6	277.8				
Ownership Cost Breakeven	169.3	160.8	153.2				
Total Cost Breakeven	476.3	452.5	430.9				

EBB3-Po3-06

Southcentral Idaho Russet Burbank Commercial Potatoes: Fumigation and On-Farm Storage

Economic costs are used in the University of Idaho costs and returns estimates. All resources are valued based on market price or opportunity cost. Input prices are based on the U of I's annual survey of agricultural supply companies. Except for contract crops, the selling price is a 10-year average. The costs and returns estimate shown here is typical for growing and storing irrigated Russet Burbank commercial potatoes in southcentral Idaho when ground is fumigated. Production practices are based on producer surveys conducted in Cassia, Gooding, Jerome, Minidoka and Twin Falls counties. Although production practices may be similar for individual farms, each 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 quality of management are all crucial factors that influence costs.

The Model Farm

This costs and returns estimate models a 1,500-acre farm with 375 acres in potatoes. In addition to potatoes, the farm also grows 375 acres of sugarbeets and 750 acres of grain. Corn or dry beans may substitute for grain. The farm uses a center pivot irrigation system and surface water delivered to the farm from an irrigation district. The district charges a flat fee per acre for water. Irrigation power costs are for pressurization only and are based on current Idaho Power rates.

Tillage, Fertilization, Pest Control, and Irrigation

After the stubble from the preceding grain crop is chopped, the potato ground is irrigated, disked twice, ripped and fumigated in the fall. The ground is chisel plowed and marked-out in the spring. Potatoes are planted in late April or early May using a 6-row planter with a 36-inch row spacing. The seeding rate is 22 hundredweight (cwt), with an additional 5 percent (1 cwt) added to account for waste. Potatoes are cultivated once in May after emergence with a basin tillage tool. In September, vines are rolled and sprayed with sulfuric acid. Potato harvest begins 3 weeks later using a 2-row harvester, 4-row windrower, and five 10-wheeler trucks (300 cwt capacity). Potatoes are hauled directly to on-farm storage. Potatoes are stored 5 months in a modern, above ground storage facility with air and humidification. In addition to labor, electricity, and sprout inhibitor, storage operating costs include a charge for shrink and interest based on the value of the stored crop. Most fertilizer is custom applied in split preplant applications, fall and spring. A liquid starter fertilizer and micronutrients are applied at mark-out. Additional nitrogen is applied postplant through the irrigation system. The weed program uses cultural, mechanical (tillage and cultivation) and herbicidal control methods. A two-way herbicide tank mix is applied at cultivation to control annual grasses and broadleaf weeds. A third herbicide is

applied by chemigation during May. For insect control, a systemic insecticide is banded at planting, and contact insecticides are applied twice by air, once in July and once in August. Three fungicide applications are made for blight control, starting in early July. All applications are made by a custom aerial applicator. Potatoes receive 23.5 inches of water during the growing season from approximately 55 irrigations (pivot revolutions), 1 inch in May, 5 inches in June, 9.5 inches in July, and 8 inches in August. One inch of water applied before harvest in September and 2 inches of water applied to the grain stubble before fall tillage are also credited to potatoes, for a total of 26.5 inches credited to potatoes.

Resources: Machinery, Land, Labor, and Capital

Table 3 lists the tractors, trucks, and other equipment used for potato production, their operating and ownership costs. Storage and handling equipment are not listed. All machinery except trucks is valued at 75 percent of replacement cost new, adjusted for price changes using USDA's Farm Machinery Prices Paid Index. This adjustment reduces the machine repair operating cost and the depreciation and interest ownership costs on equipment by 25 percent. The truck's price includes the cost of a used truck and a new self-unloading bed. The land charge is cash rent and covers the ownership costs (depreciation, interest, and insurance) on the irrigation system. A machine labor charge is made for all field operations except those performed on a custom basis. Custom operations are listed separately. The non-machine labor accounts for extra planting and harvest labor. Labor to operate machinery is valued at \$13.45 per hour, while irrigation and non-machine labor are valued at \$9.00 and \$7.95, respectively. Labor rates include a base wage plus a percentage for Social Security, Medicare, unemployment insurance, and other labor overhead expenses. Labor overhead amounts to 15 percent for non-machine labor, 25 percent for irrigation labor, and 30 percent for machinery labor. A management fee, 5 percent of gross returns, is included as an ownership cost. Interest on operating capital is charged from the time an input is applied until the month of harvest and is calculated at a nominal rate of 7.5 percent. Interest on intermediate term capital is calculated using a rate of 7.75 percent. A general overhead charge of 2.5 percent of operating expenses is included to cover unallocated whole-farm costs such as office expenses, legal and accounting fees, and 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.

Table 19. 2006 Southcentral Idaho Irrigated Russet Burbank Commercial Potatoes: With Fumigation and On-Farm Storage. Comparison With 2005.

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre				
Gross Returns								
Potatoes	440	cwt	\$5.15	\$2,266.00	430	10	2.3%	
Operating Inputs						2005	\$ Change	% Change
Seed:					\$256.45	\$209.30	\$47.15	22.5%
G-3 Potato Seed	23	cwt	\$9.50	\$218.50	\$173.65	\$44.85	25.8%	
Seed Cut and Treat	23	cwt	\$1.65	\$37.95	\$35.65	\$2.30	6.5%	
Fertilizer:					\$292.60	\$271.90	\$20.70	7.6%
Dry Nitrogen - Preplant	180	lb	\$0.38	\$68.40	\$70.20	-\$1.80	-2.6%	
Dry P2O5	220	lb	\$0.28	\$61.60	\$50.60	\$11.00	21.7%	
K2O	200	lb	\$0.25	\$50.00	\$44.00	\$6.00	13.6%	
Sulfur	80	lb	\$0.17	\$13.60	\$11.20	\$2.40	21.4%	
Micronutrients	2	ac	\$13.50	\$27.00	\$25.00	\$2.00	8.0%	
Liquid Nitrogen	130	lb	\$0.44	\$57.20	\$58.50	-\$1.30	-2.2%	
Liquid P2O5	40	lb	\$0.37	\$14.80	\$12.40	\$2.40	19.4%	
Pesticides:					\$301.93	\$311.81	-\$9.88	-3.2%
Metam Sodium	40	gal	\$3.65	\$146.00	\$146.00	\$0.00	0.0%	
Thimet 20G	15	lb	\$2.35	\$35.25	\$35.25	\$0.00	0.0%	
Prowl	1.0	qt	\$5.80	\$5.80	\$5.95	-\$0.15	-2.5%	
Sencor DF	0.75	lb	\$13.60	\$10.20	\$16.69	-\$6.49	-38.9%	
Eptam 7E	2.0	qt	\$6.55	\$13.10	\$18.40	-\$5.30	-28.8%	
Dithane F45 Rainshield	3.2	qt	\$3.90	\$12.48	\$12.00	\$0.48	4.0%	
Bravo Ultrex WDG	2.5	lb	\$7.20	\$18.00	\$17.50	\$0.50	2.9%	
Fulfill WDG	2.75	oz	\$6.25	\$17.19	\$17.33	-\$0.14	-0.8%	
Monitor 4E	0.75	qt	\$23.55	\$17.66	\$18.94	-\$1.28	-6.7%	
Sulfuric Acid	25	gal	\$1.05	\$26.25	\$23.75	\$2.50	10.5%	
Custom & Consultants:					\$104.55	\$97.90	\$6.65	6.8%
Custom Fertilize	2	ac	\$6.50	\$13.00	\$11.40	\$1.60	14.0%	
Consultant	1	ac	\$16.00	\$16.00	\$15.00	\$1.00	6.7%	
Custom Air Spray-10G	4	ac	\$9.90	\$39.60	\$33.00	\$6.60	20.0%	
Fumigation: Deep Injection	1	ac	\$27.00	\$27.00	\$30.00	-\$3.00	-10.0%	
Sulfuric Acid Application	1	ac	\$8.95	\$8.95	\$8.50	\$0.45	5.3%	
Irrigation:					\$98.80	\$102.11	-\$3.31	-3.2%
Water Assessment	1	ac	\$33.95	\$33.95	\$30.20	\$3.75	12.4%	
Irrigation Power-CP	28	acin	\$1.12	\$31.36	\$38.92	-\$7.56	-19.4%	
Irrigation Repairs	28	acin	\$0.55	\$15.40	\$15.40	\$0.00	0.0%	
Irrigation Labor-CP	2.01	hr	\$9.00	\$18.09	\$17.59	\$0.50	2.8%	
Other:					\$364.92	\$308.47	\$56.45	18.3%
Fees & Assessments	418	cwt	\$0.14	\$58.52	\$53.17	\$5.35	10.1%	
Crop Insurance	1	ac	\$38.00	\$38.00	\$36.00	\$2.00	5.6%	
Storage Operating Costs	440	cwt	\$0.61	\$268.40	\$219.30	\$49.10	22.4%	
Fuel & Lubricants				\$99.20	\$73.11	\$26.09	35.7%	
Machinery Repairs				\$44.80	\$42.66	\$2.14	5.0%	
Storage Facility & Storage Equipment Repairs				\$16.65	\$14.17	\$2.48	17.5%	
Machinery Labor	7.23	hrs	\$13.45	\$97.23	\$95.06	\$2.17	2.3%	
Other Labor	3.26	hrs	\$7.95	\$25.92	\$25.10	\$0.82	3.3%	
Operating Interest					\$62.32	\$45.85	\$16.47	35.9%
Total Operating Costs					\$1,765.37	\$1,597.44	\$167.93	10.5%
Operating Costs per Unit					\$4.01	\$3.71	\$0.30	8.0%
Net Returns Above Operating Expenses					\$500.63	\$512.31	-\$11.68	

Table 19. 2006 Southcentral Idaho Irrigated Russet Burbank Commercial Potatoes:
With Fumigation and On-Farm Storage. Comparison With 2005.

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre			
Ownership Costs:							
Tractors & Equipment Insurance			\$3.93	\$3.81	\$0.12		3.1%
Storage Facilities			\$116.00	\$103.00	\$13.00		12.6%
Potato Handling Equipment			\$55.00	\$51.00	\$4.00		7.8%
Tractors & Equipment Depreciation & Interest			\$162.61	\$142.95	\$19.66		13.8%
Irrigation Equipment Depreciation & Interest							
Land *			\$375.00	\$350.00	\$25.00		7.1%
Overhead			\$43.00	\$39.00	\$4.00		10.3%
Management Fee			\$110.00	\$107.00	\$3.00		2.8%
Total Ownership Costs			\$865.54	\$796.76	\$68.78		8.6%
Ownership Costs per Unit			\$1.97	\$1.85	\$0.11		6.2%
Total Costs per Acre			\$2,630.91	\$2,394.20	\$236.71		9.9%
Total Cost per Unit			\$5.98	\$5.57	\$0.41		7.4%
Returns to Risk			-\$364.91	-\$284.45	-\$80.46		
Notes:							
* Includes irrigation system ownership costs.							
Blue font indicates an increase.							
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	+				
	5%	Yield	5%				
<u>Price</u>	418	440	462				
Operating Cost Breakeven	\$4.22	\$4.01	\$3.82				
Ownership Cost Breakeven	\$2.07	\$1.97	\$1.87				
Total Cost Breakeven	\$6.29	\$5.98	\$5.69				
		Price					
<u>Yield</u>	\$4.89	\$5.15	\$5.41				
Operating Cost Breakeven	360.8	342.8	326.5				
Ownership Cost Breakeven	176.9	168.1	160.1				
Total Cost Breakeven	537.7	510.9	486.5				

EBB4-Po1-06

Eastern Idaho South District Russet Burbank Commercial Potatoes: No Storage and No Fumigation

Economic costs are used in the University of Idaho costs and returns estimates. All resources are valued based on market price or opportunity cost. Input prices are based on the U of I's annual survey of agricultural supply companies. Except for contract crops, the selling price is a 10-year average. The costs and returns estimate shown here is typical for growing irrigated Russet Burbank commercial potatoes in the higher yielding counties of eastern Idaho. Production practices are based on producer surveys conducted in Bingham, Bannock, and Power counties. 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 quality of management are all crucial factors that influence costs.

The Model Farm

This costs and returns estimate models a 1,500-acre farm with 500 acres in potatoes. The typical crop rotation is one year of potatoes followed by two years of grain. Corn may substitute for grain, while sugarbeets and alfalfa are grown in longer rotations. The farm uses a center pivot irrigation system and surface water delivered from an irrigation district. The irrigation district charges a flat fee per acre for water. Irrigation power costs are for pressurization only and are based on current Idaho Power rates.

Tillage, Fertilization, Pest Control, and Irrigation

After the stubble from the preceding grain crop is chopped, the potato ground is irrigated, disked twice and ripped in the fall, then chisel plowed, and marked-out for planting in the spring. Potatoes are planted in early May using a 6-row planter with 36-inch row spacing. The seeding rate is 20 hundredweight (cwt) with an additional 5 percent (1 cwt) to account for waste. Potatoes are cultivated and hilled in late May and cultivated in early June with a basin tillage tool. In September, vines are rolled and removed mechanically. Potato harvest begins three weeks later using a 2-row harvester, 4-row windrower, and five 10-wheeler trucks (300 cwt capacity). Potatoes are hauled from the field to a central location where they are transloaded into a semi trailer and transported to the processor by a custom hauler. Most fertilizer is custom applied in two preplant applications, fall and spring. A liquid phosphate starter fertilizer and micronutrients are applied at mark-out. Additional nitrogen is applied post-plant through the sprinkler system. The weed control program uses cultural, mechanical (tillage and cultivation), and herbicidal control methods. A two-way herbicide tank mix is applied

preemergence to control annual grasses and broadleaf weeds. For insect control, a systemic insecticide is banded at planting and a contact insecticide is applied by air in July. Two fungicide applications are made for blight control, starting in July. The first application is made by custom ground application and the second is custom applied by air. Potatoes receive 20.5 inches of water during the growing season from approximately 47 irrigations (pivot revolutions), .5 inches in May, 6 inches in June, 8 inches in July, and 6 inches in August. One inch of water is applied pre-harvest in September and 1.5 inches are applied to the grain stubble for a total of 23 inches credited to the potato crop.

Resources: Machinery, Land, Labor, and Capital

Table 3 lists the tractors, trucks, and other equipment used to produce potatoes, along with their operating and ownership costs. Transloading equipment is not listed. All machinery except trucks is valued at 75 percent of replacement cost new prices shown in Table 3, adjusted for price changes using USDA's Farm Machinery Prices Paid Index. This adjustment reduces the machinery repair operating cost and the depreciation and interest ownership costs on equipment by 25 percent. Each truck's price includes the cost of a used truck and the cost of a new self-unloading bed. The land charge is cash rent and covers the ownership costs (depreciation, interest, and insurance) on the irrigation system. A machine labor charge is made for all field operations except those performed on a custom basis. Custom operations are listed separately. The non-machine labor accounts for extra planting and harvest labor. Labor to operate machinery is valued at \$13.45 per hour, while irrigation and non-machine labor are valued at \$9.00 and \$7.95, respectively. Labor rates include a base wage plus a percentage for Social Security, Medicare, unemployment insurance, and other labor overhead expenses. Labor overhead amounts to 15 percent for non-machine labor, 25 percent for irrigation labor, and 30 percent for machinery labor. A management fee, 5 percent of gross returns, is included as an ownership cost. Interest on operating capital is charged from the time an input is applied until the month of harvest and calculated at a nominal rate of 9.5 percent. Interest on intermediate term capital is calculated using a rate of 8.75 percent. A general overhead charge of 2.5 percent of operating expenses is included to cover unallocated whole-farm costs such as office expenses, legal and accounting fees, and 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 includes soil and petiole sampling and irrigation scheduling.

Table 20. 2006 Irrigated Russet Burbank Commercial Potatoes With No Storage for Eastern Idaho - South: Bannock, Bingham and Power Counties with comparison to 2005.

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre	2005	Change	% Change
Gross Returns							
Potatoes	350	cwt	\$4.90	\$1,715.00	340	10	2.9%
Operating Inputs							
Seed:					\$217.35		
G-3 Potato Seed	21	cwt	\$8.70	\$182.70	\$141.75	\$40.95	28.9%
Seed Cut and Treat	21	cwt	\$1.65	\$34.65	\$32.55	\$2.10	6.5%
Fertilizer:					\$245.45		
Nitrogen - Preplant	145	lb	\$0.40	\$58.00	\$56.55	\$1.45	2.6%
P2O5	155	lb	\$0.25	\$38.75	\$37.20	\$1.55	4.2%
K2O	175	lb	\$0.23	\$40.25	\$36.75	\$3.50	9.5%
Sulfur	85	lb	\$0.15	\$12.75	\$10.20	\$2.55	25.0%
Liquid Nitrogen	140	lb	\$0.43	\$60.20	\$60.20	\$0.00	0.0%
Liquid P2O5	60	ac	\$0.30	\$18.00	\$16.80	\$1.20	7.1%
Micronutrients	1	lb	\$17.50	\$17.50	\$16.50	\$1.00	6.1%
Pesticides:					\$102.38		
Thimet 20G	15	lb	\$2.55	\$38.25	\$36.75	\$1.50	4.1%
Sencor 75DF	0.75	lb	\$10.75	\$8.06	\$14.74	-\$6.68	-45.3%
Eptam 7EC	2.0	qt	\$6.60	\$13.20	\$17.70	-\$4.50	-25.4%
Bravo Ultrex	1.25	lb	\$7.30	\$9.13	\$8.69	\$0.44	5.0%
Dithane F45 Rainshield	3.2	qt	\$4.10	\$13.12	\$11.68	\$1.44	12.3%
Monitor 4E	0.75	qt	\$27.50	\$20.63	\$18.75	\$1.88	10.0%
Custom & Consultants:					\$121.85		
Custom Fertilize	2	ac	\$5.15	\$10.30	\$9.90	\$0.40	4.0%
Consultant	1	ac	\$16.00	\$16.00	\$15.00	\$1.00	6.7%
Custom Ground Spray-Po	1	ac	\$5.95	\$5.95	\$5.85	\$0.10	1.7%
Custom Air Spray-10G	2	ac	\$8.05	\$16.10	\$15.30	\$0.80	5.2%
Custom Hauling	350	cwt	\$0.21	\$73.50	\$61.20	\$12.30	20.1%
Irrigation:					\$75.45		
Water Assessment	1	ac	\$23.00	\$23.00	\$21.00	\$2.00	9.5%
Irrigation Power - CP*	23	acin	\$1.12	\$25.76	\$31.97	-\$6.21	-19.4%
Irrigation Repairs - CP*	23	acin	\$0.55	\$12.65	\$12.65	\$0.00	0.0%
Irrigation Labor - CP*	1.56	hr	\$9.00	\$14.04	\$13.65	\$0.39	2.9%
Other:					\$109.00		
Fees & Assessments	350	cwt	\$0.14	\$49.00	\$44.20	\$4.80	10.9%
Crop Insurance	1	ac	\$32.00	\$32.00	\$30.00	\$2.00	6.7%
Transloading Costs	350	cwt	\$0.080	\$28.00	\$23.80	\$4.20	17.6%
Fuel & Lubricants					\$110.78		
Machinery Repairs				\$40.99	\$39.02	\$1.97	5.0%
Transloading Equipment Repairs				\$7.40	\$6.00	\$1.40	23.3%
Machinery Labor	6.89	hrs	\$13.45	\$92.67	\$90.60	\$2.07	2.3%
Other Labor	2.49	hrs	\$7.95	\$19.80	\$19.17	\$0.63	3.3%
Operating Interest					\$40.50		
Total Operating Costs				\$1,183.62	\$1,067.98	\$115.64	10.8%
Operating Costs per Unit				\$3.38	\$3.14	\$0.24	7.7%
Net Returns Above Operating Expenses					\$531.38	\$547.02	-\$15.64

Table 20. 2006 Irrigated Russet Burbank Commercial Potatoes With No Storage for Eastern Idaho - South: Bannock, Bingham and Power Counties with comparison to 2005.

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre	2005	Change	% Change
Ownership Costs:							
Tractors & Equipment Insurance				\$4.18	\$4.06	\$0.12	3.0%
Transloading Equipment				\$33.00	\$31.50	\$1.50	4.8%
Tractors & Equipment Depreciation & Interest				\$175.82	\$154.74	\$21.08	13.6%
Irrigation Equipment Depreciation & Interest							
Land **				\$270.00	\$260.00	\$10.00	3.8%
Overhead				\$29.00	\$27.00	\$2.00	7.4%
Management Fee				\$84.00	\$81.00	\$3.00	3.7%
Total Ownership Costs				\$596.00	\$558.30	\$37.70	6.8%
Ownership Costs per Unit				\$1.70	\$1.64	\$0.06	3.7%
Total Costs per Acre				\$1,779.62	\$1,626.28	\$153.34	9.4%
Total Cost per Unit				\$5.08	\$4.78	\$0.30	6.3%
Returns to Risk				-\$64.62	-\$11.28	-\$53.34	
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	+				
	5%		5%				
		Yield					
<u>Price</u>	332.5	350	367.5				
Operating Cost Breakeven	\$3.56	\$3.38	\$3.22				
Ownership Cost Breakeven	\$1.79	\$1.70	\$1.62				
Total Cost Breakeven	\$5.35	\$5.08	\$4.84				
		Price					
<u>Yield</u>	\$4.66	\$4.90	\$5.15				
Operating Cost Breakeven	254.3	241.6	230.1				
Ownership Cost Breakeven	128.0	121.6	115.8				
Total Cost Breakeven	382.3	363.2	345.9				
Date:							
User's Name:							
Address:							

EBB4-Po5-06

Eastern Idaho South District Russet Burbank Commercial Potatoes: On-Farm Storage

Economic costs are used in the University of Idaho costs and returns estimates. All resources are valued based on market price or opportunity cost. Input prices are based on the U of I's annual survey of agricultural supply companies. Except for contract crops, the selling price is a 10-year average. The costs and returns estimate shown here is typical for growing and storing irrigated Russet Burbank commercial potatoes in the higher yielding counties of eastern Idaho. Production practices are based on producer surveys conducted in Bingham, Bannock, and Power counties. 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 quality of management are all crucial factors that influence costs.

The Model Farm

This costs and returns estimate models a 1,500-acre farm with 500 acres in potatoes. The typical crop rotation is one year of potatoes followed by two years of grain. Corn may substitute for grain, while sugarbeets and alfalfa are grown in longer rotations. The farm uses a center pivot irrigation system and surface water delivered from an irrigation district. The irrigation district charges a flat fee per acre for water. Irrigation power costs are for pressurization only and are based on current Idaho Power rates.

Tillage, Fertilization, Pest Control, and Irrigation

After the stubble from the preceding grain crop is chopped, the potato ground is irrigated, disked twice and ripped in the fall, then chisel plowed and marked-out for planting in the spring. Potatoes are planted in May using a 6-row planter with 36-inch row spacing. The seeding rate is 20 hundredweight (cwt) with an additional 5 percent (1 cwt) to account for waste. Potatoes are cultivated and hilled in late May and cultivated in early June with a basin tillage tool. In September, vines are rolled and removed mechanically. Potato harvest begins three weeks later using a 2-row harvester, 4-row windrower, and five 10-wheeler trucks (300 cwt capacity). Potatoes are hauled directly to on-farm storage. Potatoes are stored 5 months in a modern, above ground storage facility with air and humidification. In addition to labor, electricity, and sprout inhibitor expenses, storage operating cost includes a charge for shrink and interest based on the value of the stored crop. Most fertilizer is custom applied in two preplant applications, fall and spring. A liquid phosphate starter fertilizer and micronutrients are applied at row mark-out. Additional nitrogen is applied post-plant through the sprinkler system. The weed control program uses cultural, mechanical (tillage and cultivation), and herbicidal control methods. A two-way herbicide tank mix is applied

preemergence to control annual grasses and broadleaf weeds. For insect control, a systemic insecticide is banded at planting and a contact insecticide is applied by air in July. Two fungicide applications are made for blight control, starting in July. The first application is made by custom ground application and the second is custom applied by air. Potatoes receive 20.5 inches of water during the growing season from approximately 47 irrigations (pivot revolutions), .5 inches in May, 6 inches in June, 8 inches in July, and 6 inches in August. One inch of water is applied pre-harvest in September and 1.5 inches are applied to the grain stubble for a total of 23 inches credited to the potato crop.

Resources: Machinery, Land, Labor, and Capital

Table 3 lists the tractors, trucks, and other equipment used to produce potatoes, along with their operating and ownership costs. Storage and handling equipment are not listed. All machinery except trucks is valued at 75 percent of replacement cost new prices shown in Table 3, adjusted for price changes using USDA's Farm Machinery Prices Paid Index. This adjustment reduces the machinery repair operating cost and the depreciation and interest ownership costs on equipment by 25 percent. Each truck's price includes the cost of a used truck and the cost of a new self-unloading bed. The land charge is cash rent and covers the ownership costs (depreciation, interest, and insurance) on the irrigation system. A machine labor charge is made for all field operations except those performed on a custom basis. Custom operations are listed separately. The non-machine labor accounts for extra planting and harvest labor. Labor to operate machinery is valued at \$13.45 per hour, while irrigation and non-machine labor are valued at \$9.00 and \$7.95, respectively. Labor rates include a base wage plus a percentage for Social Security, Medicare, unemployment insurance, and other labor overhead expenses. Labor overhead amounts to 15 percent for non-machine labor, 25 percent for irrigation labor, and 30 percent for machinery labor. A management fee, 5 percent of gross returns, is included as an ownership cost. Interest on operating capital is charged from the time an input is applied until the month of harvest and calculated at a nominal rate of 9.5 percent. Interest on intermediate term capital is calculated using a rate of 8.75 percent. A general overhead charge of 2.5 percent of operating expenses is included to cover unallocated whole-farm costs such as office expenses, legal and accounting fees, and 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 includes soil and petiole sampling and irrigation scheduling.

Table 21. 2006 Irrigated Russet Burbank Commercial Potatoes With On-Farm Storage for Eastern Idaho - South: Bannock, Bingham and Power Counties with comparison to 2005.

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre	2005	Change	% Change	
Gross Returns								
Potatoes	350	cwt	\$5.15	\$1,802.50	340	10	2.9%	
Operating Inputs								
Seed:					2005	\$ Change	% Change	
G-3 Potato Seed	21	cwt	\$8.70	\$182.70	\$141.75	\$40.95	28.9%	
Seed Cut and Treat	21	cwt	\$1.65	\$34.65	\$32.55	\$2.10	6.5%	
Fertilizer:					\$245.45	\$234.20	\$11.25	4.8%
Nitrogen - Preplant	145	lb	\$0.40	\$58.00	\$56.55	\$1.45	2.6%	
P2O5	155	lb	\$0.25	\$38.75	\$37.20	\$1.55	4.2%	
K2O	175	lb	\$0.23	\$40.25	\$36.75	\$3.50	9.5%	
Sulfur	85	lb	\$0.15	\$12.75	\$10.20	\$2.55	25.0%	
Liquid Nitrogen	140	lb	\$0.43	\$60.20	\$60.20	\$0.00	0.0%	
Liquid P2O5	60	ac	\$0.30	\$18.00	\$16.80	\$1.20	7.1%	
Micronutrients	1	lb	\$17.50	\$17.50	\$16.50	\$1.00	6.1%	
Pesticides:					\$102.38	\$108.31	-\$5.93	-5.5%
Thimet 20G	15	lb	\$2.55	\$38.25	\$36.75	\$1.50	4.1%	
Sencor DF	0.75	lb	\$10.75	\$8.06	\$14.74	-\$6.68	-45.3%	
Eptam 7E	2.0	qt	\$6.60	\$13.20	\$17.70	-\$4.50	-25.4%	
Bravo Ultrex	1.25	lb	\$7.30	\$9.13	\$8.69	\$0.44	5.0%	
Dithane F45 Rainshield	3.2	qt	\$4.10	\$13.12	\$11.68	\$1.44	12.3%	
Monitor 4E	0.75	qt	\$27.50	\$20.63	\$18.75	\$1.88	10.0%	
Custom & Consultants:					\$48.35	\$46.05	\$2.30	5.0%
Custom Fertilize	2	ac	\$5.15	\$10.30	\$9.90	\$0.40	4.0%	
Consultant	1	ac	\$16.00	\$16.00	\$15.00	\$1.00	6.7%	
Custom Ground Spray	1	ac	\$5.95	\$5.95	\$5.85	\$0.10	1.7%	
Custom Air Spray-10G	2	ac	\$8.05	\$16.10	\$15.30	\$0.80	5.2%	
Irrigation:					\$75.45	\$79.27	-\$3.82	-4.8%
Water Assessment	1	ac	\$23.00	\$23.00	\$21.00	\$2.00	9.5%	
Irrigation Power - CP*	23	acin	\$1.12	\$25.76	\$31.97	-\$6.21	-19.4%	
Irrigation Repairs - CP*	23	acin	\$0.55	\$12.65	\$12.65	\$0.00	0.0%	
Irrigation Labor - CP*	1.56	hr	\$9.00	\$14.04	\$13.65	\$0.39	2.9%	
Other:					\$292.12	\$245.39	\$46.73	19.0%
Fees & Assessments	333	cwt	\$0.14	\$46.62	\$41.99	\$4.63	11.0%	
Crop Insurance	1	ac	\$32.00	\$32.00	\$30.00	\$2.00	6.7%	
Storage Operating Costs	350	cwt	\$0.61	\$213.50	\$173.40	\$40.10	23.1%	
Fuel & Lubricants				\$109.64	\$81.75	\$27.89	34.1%	
Machinery Repairs				\$41.63	\$39.63	\$2.00	5.0%	
Storage Facility & Storage Equipment Repairs				\$13.65	\$11.57	\$2.08	18.0%	
Machinery Labor	6.99	hrs	\$13.45	\$94.02	\$91.92	\$2.10	2.3%	
Other Labor	2.49	hrs	\$7.95	\$19.80	\$19.17	\$0.63	3.3%	
Operating Interest				\$39.27	\$28.64	\$10.63	37.1%	
Total Operating Costs				\$1,299.10	\$1,160.20	\$138.90	12.0%	
Operating Costs per Unit				\$3.71	\$3.41	\$0.30	8.8%	
Net Returns Above Operating Expenses				\$503.40	\$505.80	-\$2.40		

Table 21. 2006 Irrigated Russet Burbank Commercial Potatoes With On-Farm Storage for Eastern Idaho - South: Bannock, Bingham and Power Counties with comparison to 2005.

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre	2005	Change	% Change
Ownership Costs:							
Tractors & Equipment Insurance				\$4.14	\$4.02	\$0.12	3.0%
Storage Facilities				\$92.00	\$84.00	\$8.00	9.5%
Potato Handling Equipment				\$41.00	\$38.00	\$3.00	7.9%
Tractors & Equipment Depreciation & Interest				\$174.57	\$153.66	\$20.91	13.6%
Irrigation Equipment Depreciation & Interest							
Land **				\$270.00	\$260.00	\$10.00	3.8%
Overhead				\$31.00	\$29.00	\$2.00	6.9%
Management Fee				\$88.00	\$83.00	\$5.00	6.0%
Total Ownership Costs				\$700.71	\$651.68	\$49.03	7.5%
Ownership Costs per Unit				\$2.00	\$1.92	\$0.09	4.5%
Total Costs per Acre				\$1,999.81	\$1,811.88	\$187.93	10.4%
Total Cost per Unit				\$5.71	\$5.33	\$0.38	7.2%
Returns to Risk				-\$197.31	-\$145.88	-\$51.43	
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	+				
	5%	Yield	5%				
<u>Price</u>	332.5	350	367.5				
Operating Cost Breakeven	\$3.91	\$3.71	\$3.53				
Ownership Cost Breakeven	\$2.11	\$2.00	\$1.91				
Total Cost Breakeven	\$6.01	\$5.71	\$5.44				
		Price					
<u>Yield</u>	\$4.89	\$5.15	\$5.41				
Operating Cost Breakeven	265.5	252.3	240.2				
Ownership Cost Breakeven	143.2	136.1	129.6				
Total Cost Breakeven	408.8	388.3	369.8				
Date:							
User's Name:							
Address:							

EBB4-Po6-06

Eastern Idaho South District Russet Burbank Commercial Potatoes: Fumigation and On-Farm Storage

Economic costs are used in the University of Idaho costs and returns estimates. All resources are valued based on market price or opportunity cost. Input prices are based on the U of I's annual survey of agricultural supply companies. Except for contract crops, the selling price is a 10-year average. The costs and returns estimate shown here is typical for growing irrigated Russet Burbank commercial potatoes in the higher yielding counties of eastern Idaho that fumigate. Production practices are based on producer surveys conducted in Bingham, Bannock, and Power counties. 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 quality of management are all crucial factors that influence costs.

The Model Farm

This costs and returns estimate models a 1,500-acre farm with 500 acres in potatoes. The typical crop rotation is one year of potatoes followed by two years of grain. Corn may substitute for grain, while sugarbeets and alfalfa are grown in longer rotations. The farm uses a center pivot irrigation system and surface water delivered from an irrigation district. The irrigation district charges a flat fee per acre for water. Irrigation power costs are for pressurization only and are based on current Idaho Power rates.

Tillage, Fertilization, Pest Control, and Irrigation

After the stubble from the preceding grain crop is chopped, the potato ground is irrigated, disked twice ripped and fumigated in the fall. The ground is chisel plowed and marked-out for planting in the spring. Potatoes are planted in May using a 6-row planter with 36-inch row spacing. The seeding rate is 20 hundredweight (cwt) with an additional 5 percent (1 cwt) to account for waste. Potatoes are cultivated and hilled in late May and cultivated in early June with a basin tillage tool. In September, vines are rolled and removed mechanically. Potato harvest begins three weeks later using a 2-row harvester, 4-row windrower, and five 10-wheeler trucks (300 cwt capacity). Potatoes are hauled directly to on-farm storage. Potatoes are stored 5 months in a modern, above ground storage facility with air and humidification. In addition to labor, electricity, and sprout inhibitor expenses, storage operating cost includes a charge for shrink and interest based on the value of the stored crop. Most fertilizer is custom applied in two preplant applications, fall and spring. A liquid phosphate starter fertilizer and micronutrients are applied at row mark-out. Additional nitrogen is applied post-plant through the sprinkler system. The weed control program uses cultural, mechanical (tillage and cultivation), and herbicidal control methods. A two-way herbicide tank mix is applied preemergence to control annual grasses and broadleaf weeds. For insect control, a systemic insecticide is

banded at planting and a contact insecticide is applied by air in July. Two fungicide applications are made for blight control, starting in July. The first application is made by custom ground application and the second is custom applied by air. Potatoes receive 20.5 inches of water during the growing season from approximately 47 irrigations (pivot revolutions), .5 inches in May, 6 inches in June, 8 inches in July, and 6 inches in August. One inch of water is applied pre-harvest in September, 1.5 inches are applied to the grain stubble before fall tillage and 2 inches are applied to apply/incorporate the fumigant for a total of 25 inches credited to the potato crop.

Resources: Machinery, Land, Labor, and Capital

Table 3 lists the tractors, trucks, and other equipment used to produce potatoes, along with their operating and ownership costs. Storage and handling equipment are not listed. All machinery except trucks is valued at 75 percent of replacement cost new prices shown in Table 3, adjusted for price changes using USDA's Farm Machinery Prices Paid Index. This adjustment reduces the machinery repair operating cost and the depreciation and interest ownership costs on equipment by 25 percent. Each truck's price includes the cost of a used truck and the cost of a new self-unloading bed. The land charge is cash rent and covers the ownership costs (depreciation, interest, and insurance) on the irrigation system. A machine labor charge is made for all field operations except those performed on a custom basis. Custom operations are listed separately. The non-machine labor accounts for extra planting and harvest labor. Labor to operate machinery is valued at \$13.45 per hour, while irrigation and non-machine labor are valued at \$9.00 and \$7.95, respectively. Labor rates include a base wage plus a percentage for Social Security, Medicare, unemployment insurance, and other labor overhead expenses. Labor overhead amounts to 15 percent for non-machine labor, 25 percent for irrigation labor, and 30 percent for machinery labor. A management fee, 5 percent of gross returns, is included as an ownership cost. Interest on operating capital is charged from the time an input is applied until the month of harvest and calculated at a nominal rate of 9.5 percent. Interest on intermediate term capital is calculated using a rate of 8.75 percent. A general overhead charge of 2.5 percent of operating expenses is included to cover unallocated whole-farm costs such as office expenses, legal and accounting fees, and 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 includes soil and petiole sampling and irrigation scheduling.

Table 22. 2005 Irrigated Russet Burbank Commercial Potatoes With Fumigation & On-Farm Storage for Eastern Idaho - South: Bannock, Bingham and Power Counties with comparison to 2004.

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre	2005	Change	% Change	
Gross Returns								
Potatoes	390	cwt	\$5.15	\$2,008.50	380	10	2.6%	
Operating Inputs								
Seed:					\$217.35	\$174.30	\$43.05	24.7%
G-3 Potato Seed	21	cwt	\$8.70	\$182.70	\$141.75	\$40.95	28.9%	
Seed Cut and Treat	21	cwt	\$1.65	\$34.65	\$32.55	\$2.10	6.5%	
Fertilizer:					\$258.55	\$246.90	\$11.65	4.7%
Nitrogen - Preplant	155	lb	\$0.40	\$62.00	\$60.45	\$1.55	2.6%	
P2O5	165	lb	\$0.25	\$41.25	\$39.60	\$1.65	4.2%	
K2O	185	lb	\$0.23	\$42.55	\$38.85	\$3.70	9.5%	
Sulfur	85	lb	\$0.15	\$12.75	\$10.20	\$2.55	25.0%	
Liquid Nitrogen	150	lb	\$0.43	\$64.50	\$64.50	\$0.00	0.0%	
Liquid P2O5	60	ac	\$0.30	\$18.00	\$16.80	\$1.20	7.1%	
Micronutrients	1	lb	\$17.50	\$17.50	\$16.50	\$1.00	6.1%	
				\$0.00				
Pesticides:					\$258.38	\$254.31	\$4.07	1.6%
Vapam 42%	40	gal	\$3.90	\$156.00	\$146.00	\$10.00	6.8%	
Thimet 20G	15	lb	\$2.55	\$38.25	\$36.75	\$1.50	4.1%	
Sencor 75DF	0.75	lb	\$10.75	\$8.06	\$14.74	-\$6.68	-45.3%	
Eptam 7E	2.0	qt	\$6.60	\$13.20	\$17.70	-\$4.50	-25.4%	
Bravo Ultrex	1.25	lb	\$7.30	\$9.13	\$8.69	\$0.44	5.0%	
Dithane F45 Rainshield	3.2	qt	\$4.10	\$13.12	\$11.68	\$1.44	12.3%	
Monitor 4E	0.75	qt	\$27.50	\$20.63	\$18.75	\$1.88	10.0%	
Custom & Consultants:					\$48.35	\$46.05	\$2.30	5.0%
Custom Fertilize	2	ac	\$5.15	\$10.30	\$9.90	\$0.40	4.0%	
Consultant	1	ac	\$16.00	\$16.00	\$15.00	\$1.00	6.7%	
Custom Ground Spray	1	ac	\$5.95	\$5.95	\$5.85	\$0.10	1.7%	
Custom Air Spray-10G	2	ac	\$8.05	\$16.10	\$15.30	\$0.80	5.2%	
Irrigation:					\$80.41	\$84.73	-\$4.32	-5.1%
Water Assessment	1	ac	\$23.00	\$23.00	\$21.00	\$2.00	9.5%	
Irrigation Power - CP*	25	acin	\$1.12	\$28.00	\$34.75	-\$6.75	-19.4%	
Irrigation Repairs - CP*	25	acin	\$0.55	\$13.75	\$13.75	\$0.00	0.0%	
Irrigation Labor - CP*	1.74	hr	\$9.00	\$15.66	\$15.23	\$0.43	2.8%	
Other:					\$321.84	\$270.73	\$51.11	18.9%
Fees & Assessments	371	cwt	\$0.14	\$51.94	\$46.93	\$5.01	10.7%	
Crop Insurance	1	ac	\$32.00	\$32.00	\$30.00	\$2.00	6.7%	
Storage Operating Costs	390	cwt	\$0.61	\$237.90	\$193.80	\$44.10	22.8%	
Fuel & Lubricants					\$109.64	\$81.75	\$27.89	34.1%
Machinery Repairs					\$41.63	\$39.63	\$2.00	5.0%
Storage Facility & Storage Equipment Repairs					\$14.70	\$11.57	\$3.13	27.1%
Machinery Labor	6.99	hrs	\$13.45	\$94.02	\$91.92	\$2.10	2.3%	
Other Labor	2.72	hrs	\$7.95	\$21.62	\$20.94	\$0.68	3.3%	
Operating Interest					\$55.09	\$40.24	\$14.85	36.9%
Total Operating Costs					\$1,521.58	\$1,363.07	\$158.51	11.6%
Operating Costs per Unit					\$3.90	\$3.59	\$0.31	8.8%
Net Returns Above Operating Expenses					\$486.92	\$479.93	\$6.99	

Table 22. 2005 Irrigated Russet Burbank Commercial Potatoes With Fumigation & On-Farm Storage for Eastern Idaho - South: Bannock, Bingham and Power Counties with comparison to 2004.

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre	2005	Change	% Change
Ownership Costs:							
Tractors & Equipment Insurance				\$4.14	\$4.02	\$0.12	3.0%
Storage Facilities				\$103.00	\$95.00	\$8.00	8.4%
Potato Handling Equipment				\$41.00	\$38.00	\$3.00	7.9%
Tractors & Equipment Depreciation & Interest				\$174.57	\$153.66	\$20.91	13.6%
Irrigation Equipment Depreciation & Interest							
Land **				\$270.00	\$260.00	\$10.00	3.8%
Overhead				\$37.00	\$34.00	\$3.00	8.8%
Management Fee				\$98.00	\$93.00	\$5.00	5.4%
Total Ownership Costs				\$727.71	\$677.68	\$50.03	7.4%
Ownership Costs per Unit				\$1.87	\$1.78	\$0.08	4.6%
Total Costs per Acre				\$2,249.29	\$2,040.75	\$208.54	10.2%
Total Cost per Unit				\$5.77	\$5.37	\$0.40	7.4%
Returns to Risk				-\$240.79	-\$197.75	-\$43.04	
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	+				
	5%		5%				
		Yield					
<u>Price</u>	370.5	390	409.5				
Operating Cost Breakeven	\$4.11	\$3.90	\$3.72				
Ownership Cost Breakeven	\$1.96	\$1.87	\$1.78				
Total Cost Breakeven	\$6.07	\$5.77	\$5.49				
		Price					
<u>Yield</u>	\$4.89	\$5.15	\$5.41				
Operating Cost Breakeven	311.0	295.5	281.4				
Ownership Cost Breakeven	148.7	141.3	134.6				
Total Cost Breakeven	459.7	436.8	416.0				
Date:							
User's Name:							
Address:							

EBB4-Po2-06

Eastern Idaho North District Russet Burbank Commercial Potatoes: On-Farm Storage and No Fumigation

Economic costs are used in the University of Idaho costs and returns estimates. All resources are valued based on market price or opportunity cost. Input prices are based on the U of I's annual survey of agricultural supply companies. Except for contract crops, the selling price is a 10-year average. The costs and returns estimate shown here is typical for growing and storing irrigated Russet Burbank commercial potatoes in the lower yielding counties of eastern Idaho. Production practices are based on producer surveys conducted in Bonneville, Jefferson and Madison counties. 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 quality of management are all crucial factors that influence costs.

The Model Farm

This costs and returns estimate models a 1,500-acre farm with 500 acres in potatoes. The typical crop rotation is one year of potatoes followed by two years of grain. Dry peas or an oil crop may substitute for grain while alfalfa is grown in longer rotations. The farm uses a center pivot irrigation system and surface water delivered from an irrigation district. The irrigation district charges a flat fee per acre for water. Irrigation power costs are for pressurization only and are based on current Idaho Power rates.

Tillage, Fertilization, Pest Control, and Irrigation

After the stubble from the preceding grain crop is chopped, the potato ground is irrigated, disked twice, and ripped in the fall, then chisel plowed and marked-out for planting in the spring. Potatoes are planted in May using a 6-row planter with a 36-inch row spacing. The seeding rate is 19 hundredweight (cwt) with an additional 5 percent (1 cwt) to account for waste. Potatoes are cultivated and hilled in early June and cultivated later in the month with a basin tillage tool. In September, vines are rolled and then killed with sulfuric acid. Potato harvest begins 3 weeks later using a 2-row harvester, 4-row windrower, and five 10-wheeler trucks (300 cwt capacity). Potatoes are hauled directly to on-farm storage. Potatoes are stored 5 months in a modern, above ground storage facility with air and humidification. In addition to labor, electricity, and sprout inhibitor, storage operating costs also include a charge for shrink and interest based on the value of the stored crop. Most fertilizer is custom applied in a split application, April and June. A liquid starter fertilizer is applied at mark-out. Nitrogen, phosphate and sulfur are also applied postplant through the sprinkler system. The weed control program uses cultural, mechanical (tillage and cultivation), and herbicidal methods. A two-

way herbicide tank mix is applied preemergence to control annual grasses and broadleaf weeds. For insect control, a systemic insecticide is banded at planting and a contact insecticide is applied by air in July. Two fungicide applications are made for blight control, starting in July. All applications are custom applied by air. Potatoes receive 18 inches of water during the growing season from approximately 41 irrigations (pivot revolutions), 5 inches in June, 8 inches in July, and 5 inches in August. One additional inch of water is applied preharvest in September and 1.5 inches of water applied to the grain stubble are also credited to potatoes, for a total of 20.5 inches.

Resources: Machinery, Land, Labor, and Capital

Table 3 lists the tractors, trucks, and other equipment used on potatoes, along with their operating and ownership costs. Storage and handling equipment are not listed. All machinery except trucks is valued at 75 percent of replacement cost new prices shown in Table 3, adjusted for price changes using USDA's Farm Machinery Prices Paid Index. This adjustment reduces the machinery repair operating cost and the depreciation and interest ownership costs on equipment by 25 percent. Each truck's price includes the cost of a used truck and the cost of a new self-unloading bed. The land charge is cash rent and covers the ownership costs (depreciation, interest, and insurance) on the irrigation system. A machine labor charge is made for all field operations except those performed on a custom basis. Custom operations are listed separately. The non-machine labor accounts for extra planting and harvest labor. Labor to operate machinery is valued at \$13.45 per hour, while irrigation and other labor are valued at \$9.00 and \$7.95, respectively. Labor rates include a base wage plus a percentage for Social Security, Medicare, unemployment insurance, and non-machine labor overhead expenses. Labor overhead amounts to 15 percent for non-machine labor, 25 percent for irrigation labor, and 30 percent for machinery labor. A management fee, 5 percent of gross returns, is included as an ownership cost. Interest on operating capital is charged from the time an input is applied until the month of harvest and calculated at a nominal rate of 9.5 percent. Interest on intermediate term capital is calculated using a rate of 8.75 percent. A general overhead charge of 2.5 percent of operating expenses is included to cover unallocated whole-farm costs such as office expenses, legal and accounting fees, and 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 includes soil and petiole sampling and irrigation scheduling.

Table 23. 2005 Irrigated Russet Burbank Commercial Potatoes With On-Farm Storage for Eastern Idaho - North: Bonneville, Jefferson and Madison Counties with comparison to 2004.

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre	2005	Change	% Change	
Gross Returns								
Potatoes	330	cwt	\$5.15	\$1,699.50	320	10	3.1%	
Operating Inputs								
Seed:					\$200.00	\$159.00	\$41.00	25.8%
G-3 Potato Seed	20	cwt	\$8.35	\$167.00	\$128.00	\$39.00	30.5%	
Seed Cut and Treat	20	cwt	\$1.65	\$33.00	\$31.00	\$2.00	6.5%	
Fertilizer:					\$202.85	\$193.00	\$9.85	5.1%
Nitrogen	150	lb	\$0.40	\$60.00	\$58.50	\$1.50	2.6%	
P2O5	100	lb	\$0.25	\$25.00	\$24.00	\$1.00	4.2%	
K2O	140	lb	\$0.23	\$32.20	\$29.40	\$2.80	9.5%	
Sulfur	65	lb	\$0.15	\$9.75	\$7.80	\$1.95	25.0%	
Liquid Nitrogen	80	lb	\$0.43	\$34.40	\$34.40	\$0.00	0.0%	
Liquid P2O5	80	ac	\$0.30	\$24.00	\$22.40	\$1.60	7.1%	
Micronutrients	1	lb	\$17.50	\$17.50	\$16.50	\$1.00	6.1%	
				\$0.00				
Pesticides:					\$111.63	\$120.44	-\$8.81	-7.3%
Thimet 20G	15	lb	\$2.55	\$38.25	\$36.75	\$1.50	4.1%	
Sencor DF	0.75	lb	\$10.75	\$8.06	\$14.74	-\$6.68	-45.3%	
Eptam 7E	2.0	qt	\$6.60	\$13.20	\$17.70	-\$4.50	-25.4%	
Bravo Ultrex	1.25	lb	\$7.30	\$9.13	\$8.69	\$0.44	5.0%	
Dithane F45 Rainshield	3.2	qt	\$4.10	\$13.12	\$11.68	\$1.44	12.3%	
Furadan 4F	0.5	qt	\$19.75	\$9.88	\$10.88	-\$1.01	-9.2%	
Sulfuric Acid	25	gal	\$0.80	\$20.00	\$20.00	\$0.00	0.0%	
Custom & Consultants:					\$59.50	\$55.85	\$3.65	6.5%
Custom Fertilize	2	ac	\$5.15	\$10.30	\$9.90	\$0.40	4.0%	
Consultant	1	ac	\$16.00	\$16.00	\$15.00	\$1.00	6.7%	
Custom Air Spray-10G	3	ac	\$8.05	\$24.15	\$22.95	\$1.20	5.2%	
Sulfuric Acid Application	1	ac	\$9.05	\$9.05	\$8.00	\$1.05	13.1%	
				\$0.00				
Irrigation:					\$56.21	\$61.36	-\$5.16	-8.4%
Water Assessment	1	ac	\$9.55	\$9.55	\$9.50	\$0.05	0.5%	
Irrigation Power - CP*	20.5	acin	\$1.12	\$22.96	\$28.50	-\$5.54	-19.4%	
Irrigation Repairs - CP*	20.5	acin	\$0.55	\$11.28	\$11.28	\$0.00	0.0%	
Irrigation Labor - CP*	1.38	hr	\$9.00	\$12.42	\$12.08	\$0.34	2.8%	
Other:					\$275.26	\$230.72	\$44.54	19.3%
Fees & Assessments	314	cwt	\$0.14	\$43.96	\$39.52	\$4.44	11.2%	
Crop Insurance	1	ac	\$30.00	\$30.00	\$28.00	\$2.00	7.1%	
Storage Operating Costs	330	cwt	\$0.61	\$201.30	\$163.20	\$38.10	23.3%	
Fuel & Lubricants				\$101.60	\$75.76	\$25.84	34.1%	
Machinery Repairs				\$38.50	\$36.65	\$1.85	5.0%	
Storage Facility & Storage Equipment Repairs				\$13.10	\$10.63	\$2.47	23.2%	
Machinery Labor	6.49	hrs	\$13.45	\$87.22	\$85.28	\$1.94	2.3%	
Other Labor	2.18	hrs	\$7.95	\$17.33	\$16.79	\$0.54	3.2%	
Operating Interest					\$29.17	\$20.98	\$8.19	39.0%
Total Operating Costs				\$1,192.37	\$1,066.46	\$125.91	11.8%	
Operating Costs per Unit				\$3.61	\$3.33	\$0.28	8.4%	
Net Returns Above Operating Expenses				\$507.13	\$501.54	\$5.59		

Table 23. 2005 Irrigated Russet Burbank Commercial Potatoes With On-Farm Storage for Eastern Idaho - North: Bonneville, Jefferson and Madison Counties with comparison to 2004.

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre	2005	Change	% Change
Ownership Costs:							
Tractors & Equipment Insurance				\$3.84	\$3.72	\$0.12	3.2%
Storage Facilities				\$86.00	\$77.00	\$9.00	11.7%
Potato Handling Equipment				\$41.00	\$38.00	\$3.00	7.9%
Tractors & Equipment Depreciation & Interest				\$161.70	\$142.32	\$19.38	13.6%
Irrigation Equipment Depreciation & Interest							
Land **				\$245.00	\$230.00	\$15.00	6.5%
Overhead				\$29.00	\$27.00	\$2.00	7.4%
Management Fee				\$82.00	\$78.00	\$4.00	5.1%
Total Ownership Costs				\$648.54	\$596.04	\$52.50	8.8%
Ownership Costs per Unit				\$1.97	\$1.86	\$0.10	5.5%
Total Costs per Acre				\$1,840.91	\$1,662.50	\$178.41	10.7%
Total Cost per Unit				\$5.58	\$5.20	\$0.38	7.4%
Returns to Risk				-\$141.41	-\$94.50	-\$46.91	
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	+				
	5%		5%				
		Yield					
<u>Price</u>	313.5	330	346.5				
Operating Cost Breakeven	\$3.80	\$3.61	\$3.44				
Ownership Cost Breakeven	\$2.07	\$1.97	\$1.87				
Total Cost Breakeven	\$5.87	\$5.58	\$5.31				
		Price					
<u>Yield</u>	\$4.89	\$5.15	\$5.41				
Operating Cost Breakeven	243.7	231.5	220.5				
Ownership Cost Breakeven	132.6	125.9	119.9				
Total Cost Breakeven	376.3	357.5	340.4				
Date:							
User's Name:							
Address:							

EBB4-Po4-06

Eastern Idaho North District Russet Burbank G3 Seed Potatoes: On-Farm Storage

Economic costs are used in the University of Idaho costs and returns estimates. All resources are valued based on market price or opportunity cost. Input prices are based on the U of I's annual survey of agricultural supply companies. Except for contract crops, the selling price is a 10-year average. The costs and returns estimate shown here is typical for growing and storing irrigated Russet Burbank seed potatoes in southeastern Idaho. Production practices are based on producer surveys conducted in Fremont and Teton counties. Although production practices may be similar for individual farms, each 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 quality of management are all crucial factors that influence costs.

The Model Farm

This costs and returns estimate models a 1,350-acre farm with 350 acres in seed potatoes. The crop rotation is one year of potatoes followed by two to three years of grain, alfalfa, dry peas, or an oil seed crop. The farm has a center pivot irrigation system that pressurizes surface water delivered to the farm from an irrigation district. The district charges a flat water assessment fee per acre. Irrigation power costs are for pressurization only and are based on current Idaho Power rates.

Tillage, Fertilization, Pest Control, and Irrigation

After the stubble from the preceding grain crop is chopped, the potato ground is disked and ripped in the fall, then disked, chisel plowed, and marked-out for planting in the spring. Potatoes are planted in late May using a 6-row planter with 36-inch row spacing. The seeding rate is 22 hundredweight (cwt), with an additional 5 percent (1 cwt) to account for waste. Hills are harrowed off after planting and potatoes are cultivated once in June after emergence. In September, vines are rolled and then killed with sulfuric acid. Potato harvest begins 3 weeks later using a 2-row harvester, a 4-row windrower, and four 10-wheeler trucks (300 cwt capacity). Potatoes are hauled directly to on-farm storage. Potatoes are stored for 5 to 6 months in a modern, above ground storage facility with air and humidification. In addition to labor and electricity expenses, storage operating cost includes a charge for shrink and interest based on the value of the crop in storage. Most fertilizer is custom applied preplant in the spring. A liquid starter fertilizer is applied at mark-out. The weed control program uses cultural, mechanical (tillage and cultivation) and herbicidal control methods. One herbicide is applied

and incorporated with the fertilizer and a second is ground applied in June. A systemic insecticide is banded at planting, and three applications of a contact insecticide are applied by air during the growing season. Two fungicide applications are made for blight control by a custom aerial applicator, starting in late July. Potatoes are rogued in July and again in August. Potatoes receive 11 inches of water during the growing season using twenty five irrigations (pivot rotations), 1 inch in June, 5 inches in July, and 5 inches in August. One additional inch of water applied before harvest is also credited to potatoes, for a total of 12 inches.

Resources: Machinery, Land, Labor, and Capital

Table 3 lists the tractors, trucks, and other equipment used on potatoes, along with their operating and ownership costs. Storage and handling equipment are not listed. All machinery except trucks is valued at 75 percent of replacement cost new prices shown in Table 3, adjusted for price changes using USDA's Farm Machinery Prices Paid Index. This adjustment reduces the machinery repair operating cost and the depreciation and interest ownership costs on equipment by 25 percent. Each truck's price includes the cost of a used truck and the cost of a new self-unloading bed. The land charge is cash rent and covers the ownership costs (depreciation, interest, and insurance) on the irrigation system. A machine labor charge is made for all field operations except those performed on a custom basis. Custom operations are listed separately. The non-machine labor accounts for extra planting and harvest labor. Labor to operate machinery is valued at \$13.45 per hour, while irrigation and other labor are valued at \$9.00 and \$7.95, respectively. Labor rates include a base wage plus a percentage for Social Security, Medicare, unemployment insurance, and non-machine labor overhead expenses. Labor overhead amounts to 15 percent for non-machine labor, 25 percent for irrigation labor, and 30 percent for machinery labor. A management fee, 5 percent of gross returns, is included as an ownership cost. Interest on operating capital is charged from the time an input is applied until the month of harvest and calculated at a nominal rate of 9.5 percent. Interest on intermediate term capital is calculated using a rate of 8.75 percent. A general overhead charge of 2.5 percent of operating expenses is included to cover unallocated whole-farm costs such as office expenses, legal and accounting fees, and utilities. VT Inspection, listed under Other Costs, is the certification and testing fee paid by the grower to the Idaho Crop Improvement Association. Fees, also listed under Other Costs, include: fees paid to the Idaho Potato Commission, the National Potato Board, and grower association dues.

Table 24. 2006 Irrigated Russet Burbank G3 Seed Potatoes With On-Farm Storage for Eastern Idaho: Caribou, Fremont and Teton Counties with Comparison to 2005.

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre	2005	Change	% Change
Gross Returns							
Seed	255	cwt	\$7.00	\$1,785.00	250	5	2.0%
Tops	20	cwt	\$4.00	\$80.00	20	0	0.0%
Total	275	cwt		\$1,865.00	270		
Operating Inputs							
Seed:				\$264.50	\$213.90	\$50.60	23.7%
G-2 Potato Seed	23	cwt	\$9.85	\$226.55	\$178.25	\$48.30	27.1%
Seed Cut and Treat	23	cwt	\$1.65	\$37.95	\$35.65	\$2.30	6.5%
Fertilizer:				\$122.45	\$116.85	\$5.60	4.8%
Nitrogen - Preplant	100	lb	\$0.40	\$40.00	\$39.00	\$1.00	2.6%
P2O5	80	lb	\$0.25	\$20.00	\$19.20	\$0.80	4.2%
K2O	75	lb	\$0.23	\$17.25	\$15.75	\$1.50	9.5%
Sulfur	30	lb	\$0.15	\$4.50	\$3.60	\$0.90	25.0%
Liquid Nitrogen	40	lb	\$0.43	\$17.20	\$17.20	\$0.00	0.0%
Liquid P2O5	20	ac	\$0.30	\$6.00	\$5.60	\$0.40	7.1%
Micronutrients	1	lb	\$17.50	\$17.50	\$16.50	\$1.00	6.1%
Pesticides:				\$184.26	\$184.56	-\$0.30	-0.2%
Thimet 20G	15	lb	\$2.55	\$38.25	\$36.75	\$1.50	4.1%
Sencor DF	0.75	qt	\$10.75	\$8.06	\$14.74	-\$6.68	-45.3%
Eptam 7E	2.0	qt	\$6.60	\$13.20	\$17.70	-\$4.50	-25.4%
Bravo Ultrex	1.25	lb	\$7.30	\$9.13	\$8.69	\$0.44	5.0%
Monitor 4E	3.0	qt	\$27.50	\$82.50	\$75.00	\$7.50	10.0%
Dithane F45 Rainshield	3.2	qt	\$4.10	\$13.12	\$11.68	\$1.44	12.3%
Sulfuric Acid	25.0	gal	\$0.80	\$20.00	\$20.00	\$0.00	0.0%
Custom & Consultants:				\$60.30	\$56.75	\$3.55	6.3%
Custom Fertilize	1	ac	\$5.15	\$5.15	\$4.95	\$0.20	4.0%
Custom Ground Spray	1	ac	\$5.95	\$5.95	\$5.85	\$0.10	1.7%
Custom Air Spray-10G	3	ac	\$8.05	\$24.15	\$22.95	\$1.20	5.2%
Sulfuric Acid Application	1	ac	\$9.05	\$9.05	\$8.00	\$1.05	13.1%
Consultant	1	ac	\$16.00	\$16.00	\$15.00	\$1.00	6.7%
Rogueing	2	ac	\$10.00	\$20.00	\$18.00	\$2.00	11.1%
Irrigation:				\$36.88	\$39.87	-\$2.99	-7.5%
Water Assessment	1	ac	\$9.55	\$9.55	\$9.50	\$0.05	0.5%
Irrigation Power-CP	12	acin	\$1.12	\$13.44	\$16.68	-\$3.24	-19.4%
Irrigation Repairs	12	acin	\$0.55	\$6.60	\$6.60	\$0.00	0.0%
Irrigation Labor-CP	0.81	hr	\$9.00	\$7.29	\$7.09	\$0.20	2.8%
Other:				\$319.88	\$259.44	\$60.44	23.3%
Crop Insurance	1	ac	\$34.00	\$34.00	\$32.50	\$1.50	4.6%
Certification	1	ac	\$22.00	\$22.00	\$21.00	\$1.00	4.8%
Tagging	1	ac	\$26.00	\$26.00	\$25.00	\$1.00	4.0%
Fees	242	cwt	\$0.14	\$33.88	\$30.94	\$2.94	9.5%
Storage Operating Costs	255	cwt	\$0.80	\$204.00	\$150.00	\$54.00	36.0%
Fuel & Lubricants				\$97.71	\$72.87	\$24.84	34.1%
Machinery Repairs				\$33.63	\$32.03	\$1.60	5.0%
Storage Facility & Storage Equipment Repairs				\$10.85	\$10.30	\$0.55	5.3%
Machinery Labor	5.84	hrs	\$13.45	\$78.55	\$76.80	\$1.75	2.3%
Other Labor	4.53	hrs	\$7.95	\$36.01	\$34.88	\$1.13	3.2%
Operating Interest				\$31.52	\$22.71	\$8.81	38.8%

Table 24. 2006 Irrigated Russet Burbank G3 Seed Potatoes With On-Farm Storage for Eastern Idaho: Caribou, Fremont and Teton Counties with Comparison to 2005.

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre	2005	Change	% Change
Total Operating Costs				\$1,296.54	\$1,120.96	\$175.58	15.7%
Operating Costs per Cwt Based on Total Yield				\$4.71	\$4.15	\$0.56	13.6%
Operating Costs per Cwt Based on Seed Only & Adjusted Operating Costs'				\$4.85	\$4.36	\$0.49	11.1%
Net Returns Above Operating Expenses				\$568.46	\$441.54	\$126.92	
Ownership Costs:							
Tractors & Equipment Insurance				\$4.01	\$3.89	\$0.12	3.1%
Storage Facilities				\$66.00	\$56.00	\$10.00	17.9%
Potato Handling Equipment				\$71.00	\$65.00	\$6.00	9.2%
Tractors & Equipment Depreciation & Interest				\$171.20	\$150.82	\$20.38	13.5%
Irrigation Equipment Depreciation & Interest							
Land **				\$200.00	\$180.00	\$20.00	11.1%
Overhead				\$30.00	\$28.00	\$2.00	7.1%
Management Fee				\$84.00	\$78.00	\$6.00	7.7%
Total Ownership Costs				\$626.21	\$561.71	\$64.50	11.5%
Ownership Costs per Cwt Based on Total Yield				\$2.28	\$2.08	\$0.20	9.5%
Ownership Costs per Cwt Based on Seed Only & Adjusted Ownership Costs'				\$2.38	\$2.21	\$0.17	7.7%
Total Costs per Acre				\$1,922.75	\$1,682.67	\$240.08	14.3%
Total Cost per Cwt Based on Total Yield				\$6.99	\$6.23	\$0.76	12.2%
Total Cost per Cwt Base on Seed Only and Adjusted Total Costs'				\$7.23	\$6.57	\$0.66	10.0%
Returns to Risk				-\$137.75	-\$120.17	-\$17.58	
Notes							
* Costs are adjusted by subtracting revenue from tops before dividing by seed yield.							
* Revenue from tops is apportioned as follows: 75% operating and 25% ownership							
** 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.							
Seed Only							
Breakeven Analysis:							
	-	Base	+				
	5%	Yield	5%				
<u>Price</u>	242.25	255	267.75				
Operating Cost Breakeven	\$5.10	\$4.85	\$4.62				
Ownership Cost Breakeven	\$2.50	\$2.38	\$2.26				
Total Cost Breakeven	\$7.61	\$7.23	\$6.88				
		Price					
<u>Yield</u>	\$6.65	\$7.00	\$7.35				
Operating Cost Breakeven	185.9	176.6	168.2				
Ownership Cost Breakeven	91.2	86.6	82.5				
Total Cost Breakeven	277.1	263.2	250.7				