



University of Idaho
College of Agricultural and Life Sciences

ESTIMATED ECONOMIC IMPACTS OF THE SUGARBEET INDUSTRY IN IDAHO

By

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EXECUTIVE SUMMARY

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Sugarbeets have been grown in Idaho since 1903. They are an important cash crop in irrigated areas of the Snake River Valley and contribute to the overall economy of the state. This study was conducted to estimate the economic impacts of the sugarbeet industry on the Idaho economy.

The Economic Impacts of Sugarbeet Production in Idaho

The study is based on an economic impact assessment, which focuses on changes in *export activity* (base activity) in a region and traces its backward linkages throughout the economy. Export activity is defined as any economic activity that brings new money into the state. An export base assessment explains causation. An IMPLAN input-output model of Idaho was developed and employed to estimate the impacts of sugarbeets on the Idaho economy.

The economic importance of sugarbeet production and processing on Idaho's economy was determined by completing a two-part analysis, as follows:

- 1) Estimate the sugarbeet industry's contribution to the state's economy in 2001 (the most recent year for which data are available).
- 2) Estimate the impacts on the state's economy that would result if sugarbeet production ceased in Idaho.

The importance of the sugarbeet industry to the state of Idaho, in terms of the industry's overall contribution to the state's economy in 2001 was established by removing all sugarbeet production and processing (with no conversion to alternative crops) from the profile of Idaho's economy, then measuring the resulting loss of economic activity within each sector. The impacts on the state's economy that would result if sugarbeet production ceased in Idaho were estimated by evaluating the economic changes that would occur in Idaho's economy if sugarbeet production and processing ceased, but sugarbeet acreage was converted to other crops. Summary results of these analyses are shown below.

	Gross Sales	Value-Added	Employment	Earnings	Indirect Business Taxes
1) Total Idaho Economic Activity Attributable to Sugarbeets (2001)	\$1.1 billion	\$338 million	7,053 jobs	\$213 million	\$29.7 million
2) Economic Impacts on Idaho (losses) from Loss of Sugarbeet Production and Processing	\$(721 million)	\$(163 million)	(3,414 jobs)	\$(111 million)	\$(12.0 million)

So, total Idaho economic activities attributable to sugarbeets in 2001 (row 1 in the above table) was \$1.1 billion in gross sales, \$338 million in value-added, 7,053 jobs, \$213 million in earnings, and \$29.7 million in indirect business taxes. These numbers could be compared to similarly defined numbers for Idaho's entire economy or for other basic (exporting) sectors in Idaho's economy.

Economic impacts on Idaho's economy from loss of the sugarbeet industry (shown in row 2 of the above table) are \$721 million in gross sales, \$163 million in value-added, 3,414 jobs, \$111 million in earnings and \$12.0 million in indirect business taxes. These numbers are less than the economic activity attributable to sugarbeets because they were developed assuming that sugarbeet land would be planted in other crops and the resulting economic activity would offset some of the losses associated with losing sugarbeet production and processing.

Price and Production Effects on Alternative Crops if Sugarbeet Production Ceased

In the absence of sugarbeet production, there would be an expansion of alternative crop production to replace it. Crops that would be produced on released Idaho sugarbeet acreage would include potatoes, onions, wheat, barley, alfalfa hay, dry beans, corn grain, and corn silage. Wheat, barley, alfalfa hay, dry beans, corn grain, and corn silage are in almost perfectly competitive markets. Thus, increases in Idaho production would not result in changes in the individual prices of the commodities. Because prices remain stable and production increases, the total value of production for each of these commodities would increase, and partially offset the losses incurred by the loss of value in sugarbeets.

However, increased production of Idaho potatoes and onions would result in lower producer prices for these commodities. It was estimated that if Idaho sugarbeet production ceased, increased potato and onion production in the state would cause prices for all Idaho potatoes to decline by about 17 percent and prices for all Idaho onions to decline by about 7 percent. These price declines would mean that **gross revenues per acre for all Idaho potatoes and onions would decline by about \$288 and \$466, respectively.** Such revenue declines would affect the profitability of potato and onion production in Idaho.

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Introduction

Sugarbeets have been grown in Idaho since 1903. They are an important cash crop in all irrigated areas of the Snake River Valley and contribute to the overall economy of the state. Results of analysis to estimate the impacts of sugarbeet production and processing on Idaho's economy are reported in this paper. This analysis was conducted in two parts:

- 1) Determine the importance of the sugarbeet industry on the state of Idaho, in terms of the industry's contribution to the state's economy.
- 2) Determine the impacts on the state's economy that would result if sugarbeet production ceased in Idaho.

The economic impact analysis is supplemented by an analysis of the effects on prices and outputs of other crops that might result if sugarbeet production ceased in Idaho.

The study was sponsored by the Snake River Sugar Company and completed in April 2004. This study is based on 2000, 2001, and 2002 economic data. The impact analysis is based on data for 2001, the most recent year for which full, detailed economic data are available. Specific information on production and prices for sugarbeets and other crops is based on three-year averages over 2000, 2001, and 2002.

Overview of Idaho Economy

Idaho Land Demographics

Idaho is primarily a rural state, with much of the land area owned by the federal government (63 percent) and state government (5.1 percent). Only 31.6 percent of Idaho land is in private ownership, and only 0.4 percent of Idaho is classified urban. Idaho is ranked 11th in the nation in terms of land area excluding water (82,751 sq. miles). One county (Idaho County) alone is bigger than the states of New Hampshire and Massachusetts. Idaho's population was 1,366,332 in 2003. In terms of population density, Idaho has 15.6 people per square mile as opposed to 79.6 people per square mile in the U.S. (Idaho Department of Commerce and U.S. Bureau of Census)

Idaho's Economy by Measure

Table 1 presents an overview of Idaho's economy in 2001 by industry. The economy was aggregated into 20 separate industries. They range from agriculture and agricultural processing, to manufacturing, high technology manufacturing and services, medical services, and finally local, state and federal governments (Table 1, Column 1).

There are five measures of Idaho economic activity reported in Table 1. The first is gross sales, which is calculated by aggregating the total sales from all economic activity in the state. In 2001,

gross sales for Idaho were \$65.9 billion (located at the bottom of the second column). For agriculture and agricultural processing (including sugarbeet production and processing) gross sales were \$8.8 billion or 12 percent of the total for the state.

Gross sales are not the best indicator of economic activity because of "double counting". Total sales include intermediate sales in production, which get counted over and over again as productive activity moves from raw materials to final goods and services sold to the public. For example, the dollar sales value of sugarbeets paid to producers are counted several times as they move from farms through processing to the end consumers in supermarkets.

TABLE 1. IDAHO ECONOMIC PROFILE, 2001

Industry	Sales	%	Value-added	%	Jobs	%	Earnings	%	Indirect Bus Taxes	%
	\$ Million		\$ Million				\$ Million		\$ Million	
Ag/Ag Processing	\$ 8,804	12%	\$ 2,362	6%	58,312	7%	\$ 1,688	6%	\$ 156	6%
Wood and Paper Manufacturing	\$ 3,002	5%	\$ 1,193	3%	26,238	3%	\$ 832	3%	\$ 48	2%
Mining	\$ 541	1%	\$ 236	1%	2,884	0%	\$ 157	1%	\$ 18	1%
Energy Supply & Distribution	\$ 908	1%	\$ 492	1%	1,459	0%	\$ 187	1%	\$ 95	4%
Transportation and Communication	\$ 3,363	5%	\$ 1,620	4%	30,484	4%	\$1,121	5%	\$ 100	4%
Construction	\$ 5,554	8%	\$ 2,364	7%	68,840	8%	\$2,585	11%	\$ 44	2%
Manufacturing	\$ 2,776	4%	\$ 937	3%	16,647	2%	\$ 577	2%	\$ 21	1%
High Tech. Manufacturing/Services	\$ 5,566	8%	\$ 3,394	9%	42,952	5%	\$2,417	10%	\$ 47	2%
Trade -- Retail and Wholesale	\$ 7,184	11%	\$ 4,416	12%	119,381	15%	\$2,978	12%	\$ 976	37%
Services	\$ 6,811	10%	\$ 4,367	12%	122,886	15%	\$3,000	12%	\$ 155	6%
Publications	\$ 553	1%	\$ 232	1%	5,939	1%	\$ 156	1%	\$ 4	0%
Arts & Recreation	\$ 288	0%	\$ 127	0%	7,953	1%	\$ 103	0%	\$ 7	0%
Finance/Real Estate/Banking	\$ 8,443	13%	\$ 5,622	16%	50,237	6%	\$1,113	5%	\$ 816	31%
Eating/ Drinking/Visitors	\$ 2,081	3%	\$ 972	3%	55,302	7%	\$ 803	3%	\$ 115	4%
Private Education/Religion	\$ 170	0%	\$ 97	0%	4,616	1%	\$ 100	0%	\$ -	0%
Medical Services	\$ 4,164	6%	\$ 2,324	6%	68,938	8%	\$2,050	8%	\$ 23	1%
Recreation	\$ 290	0%	\$ 188	1%	8,086	1%	\$ 129	1%	\$ 14	1%
State/Local Govt (Excluding Education)	\$ 2,302	3%	\$ 2,076	6%	48,872	6%	\$1,707	7%	\$ 2	0%
State & Local Education	\$ 1,635	2%	\$ 1,635	5%	48,343	6%	\$1,428	6%	\$ -	0%
Federal Govt	\$ 1,508	2%	\$ 1,503	4%	24,687	3%	\$1,288	5%	\$ -	0%
Total	\$65,942	100%	\$36,156	100%	813,062	100%	\$24,416	100%	\$2,643	100%

Source: Minnesota IMPLAN Group and U.S. Bureau of Economic Analysis

A second measure of economic output is value-added, which is equivalent to the Gross Domestic Product measure used to report output in the U.S. Intermediate sales and the resulting double-counting are removed in this measure. In 2001, value added for Idaho totaled \$36.2 billion. Value added for agriculture and agricultural processing was \$2.4 billion or 6 percent of the state total.

A third measure of economic activity is employment. The total number of jobs reported by industry includes both full-time and part-time employment. Total employment in Idaho in 2001 equaled 813,062 jobs. Total employment for agriculture and agricultural processing was 58,312 jobs or 7 percent of Idaho's total employment.

A fourth measure of economic activity is earnings, which includes wage and salary income and proprietor income. Total earnings for the state in 2001 equaled \$24.4 billion, of which agriculture and agricultural processing accounted for 6 percent of the total with \$1.69 billion in earnings.

The fifth measure of economic activity is indirect business taxes, which include all taxes paid by business and households except personal and corporate income taxes. Indirect business taxes totaled \$2.6 billion in Idaho in 2001, of which \$156 million (6 percent of the state's total) was from agriculture and agricultural processing.

These measures represented in Table 1 are size measures of economic activity; *not* economic impacts. The impacts of economic linkages are not considered in this profile. When these linkages are included, agriculture's contribution to the overall economy of Idaho is substantially larger than reported in Table 1.

Idaho's Farm Economy

Idaho is an important agricultural state, ranking 1st in the nation in the production of potatoes and Austrian winter peas; 2nd in the nation in wrinkled seed peas, lentils, barley, and sugarbeets, 3rd in the nation in alfalfa hay, dry edible peas, mint, hops, onions (summer storage), prunes and plums; 4th in the nation in other spring wheat; 5th in the nation in winter wheat and dry edible beans; 6th in the nation in sweet cherries and all wheat; 8th in the nation in all hay; and 10th in the nation in apple production. (Idaho Agricultural Statistics Service)

In 2002, 41,554 persons were employed in Idaho agricultural production, ranking 28th in the nation. In contrast, California ranked 1st with 329,000 farm workers and Alaska ranked 50th with 822 workers. If food processing is grouped with agriculture, total combined employment of the two was more than 58,000. Idaho ranked 6th in the nation in terms of the percentage of the workforce employed in agriculture (5.3 percent) in 2002, comparable to 1.9 percent for the nation as a whole. Idaho ranked 21st in the nation in 2001 in terms of total sales revenues for plant and meat products. In terms of cash receipts for crops, Idaho ranked 19th; and Idaho ranked 17th in the nation in terms of cash receipts for livestock and livestock products. (U.S. Bureau of Economic Analysis)

In 2002, Idaho agricultural revenues were about evenly divided between crop products (49 percent) and livestock products (51 percent); totaling \$3.93 billion (Table 2). In terms of product ranking of crops by revenues in Idaho; potatoes were 1st (\$706 million), followed by wheat (\$294 million), hay (\$268 million) and sugarbeets (\$204 million). (Idaho Agricultural Statistics Service)

TABLE 2. CASH RECEIPTS FROM 2002 FARM MARKETINGS (1,000 DOLLARS)

CROPS TOTAL Sub-total	1,935,140	49.2%
<u>Food Grains</u>		
Wheat	294,310	7.5%
<u>Feed Crops</u>		
Barley	150,536	3.8%
Corn	16,765	0.4%
Hay	268,026	6.8%
Oats	1,403	0.0%
<u>Vegetables</u>		
Onions	38,076	1.0%
Potatoes	706,311	18.0%
Sweet Corn for Processing	6,682	0.2%
<u>Fruit</u>		0.0%
Apples	13,452	0.3%
Cherries	2,533	0.1%
Peaches	5,546	0.1%
Plums and Prunes	1,045	0.0%
<u>Other Crops</u>		
Dry Beans	34,268	0.9%
Dry Edible Peas	4,992	0.1%
Greenhouse and Nursery	68,000	1.7%
Hops	8,721	0.2%
Lentils	9,821	0.2%
Mint	18,028	0.5%
Sugarbeets	204,120	5.2%
Miscellaneous 2/	82,505	2.1%
LIVESTOCK Sub-total	1,998,531	50.8%
Cattle and Calves	976,261	24.8%
Hogs	6,683	0.2%
Sheep and Lambs	17,360	0.4%
Eggs	11,616	0.3%
Milk, All	917,786	23.3%
Wool	1,417	0.0%
Trout	30,456	0.8%
Other Livestock and Products		
TOTAL RECEIPTS FROM MARKETINGS	3,933,671	100.0%

Source: Idaho Agricultural Statistics Service

Sugarbeets

Sugarbeet acreage has risen steadily over time reaching 212,000 acres in 2003. Production has experienced a corresponding increase, reaching 5,130,000 tons in 2002 and nearly 6,000,000 tons in 2003 (Figure I). Sales reached \$212,285,000 in 2002 (Figure II).

Idaho ranks 2nd in sugarbeet production in the U.S. behind Minnesota; and followed by North Dakota, Michigan, California, and Montana (Figure III). Idaho sugarbeet sales revenue equaled \$212.3 million in 2002, accounting for nearly 20 percent of the market (Figure IV). In contrast, Minnesota generated \$336.5 million in sales (33 percent of the market).

In terms of other related crops, Idaho ranks 1st in potato sales at \$541,992,000 in 2003 (Figure V). Other high ranking states in potato sales include Washington (\$470,408,000), California (\$250,798,000), and Wisconsin (\$188,600,000). Idaho ranks 6th in the nation in onion production, with \$51,401,000 in sales revenue (Figure VI).

Analyzing the Economics of Sugarbeet Production in Idaho

Results of analysis of the impacts of sugarbeet production on Idaho's economy are presented in this section of the report. The analysis constitutes an economic impact assessment, focusing on changes in export activity (base activity) in a region, and tracing the backward linkages throughout the economy. Export activity is defined as any economic activity that brings new money into the state.

Basic (Export) Industries Versus Nonbasic Industries

An economy has two types of industries: base industries and nonbase industries. Base industry firms bring new economic activity into a region when their goods are sold. In Idaho, the major base industries are timber/wood/paper product sales, mining sales, manufacturing, high technology companies, and agriculture and food processing. Firms providing services to individuals living outside a region's trade center, such as medical and legal services, are also included in the region's base; as are payments from federal governments (including social security, Medicare, funding for universities, welfare payments) and other out-of-state sources of income to business and residents in Idaho.

Nonbase industries include economic activities that support local consumers and businesses, recirculating incomes generated within the region. These activities include shopping malls that serve the local population, business and personal services consumed locally, and local construction contracts. Nonbase industries support base industries.

Economic base analysis is important for identifying the vital export industries in an economy. Base industries are often confused with nonbase industries. Idaho, for example, has a large retail trade sector that employed 119,381 workers or 12 percent of the workforce in 2001. From these numbers it appears that the retail trade sector contributed a large amount of economic base employment and earnings to the economy. In reality, most of this sector's employment served local industries and their workers, and is actually attributable to other export-based industries in the economy. Only the market activities and employees serving visitors from outside the area are counted as economic base activity and employment.

FIGURE I. IDAHO SUGARBEET PRODUCTION 1924-2003 (1,000 TONS)



FIGURE II. IDAHO SUGARBEET VALUE OF PRODUCTION, 1978-2003 (\$1,000)

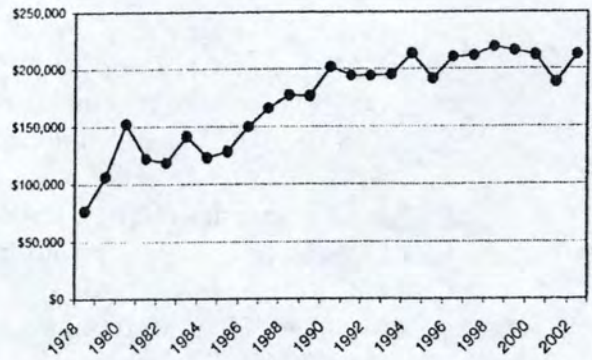


FIGURE III. U.S. SUGARBEET PRODUCTION 2003 STATE RANKINGS

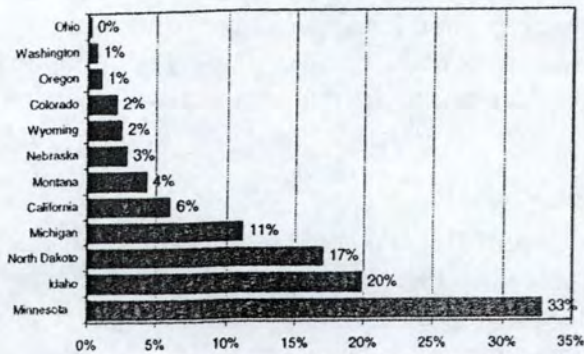


FIGURE IV. U.S. SUGARBEET SALES (\$1,000) 2003 STATE RANKINGS

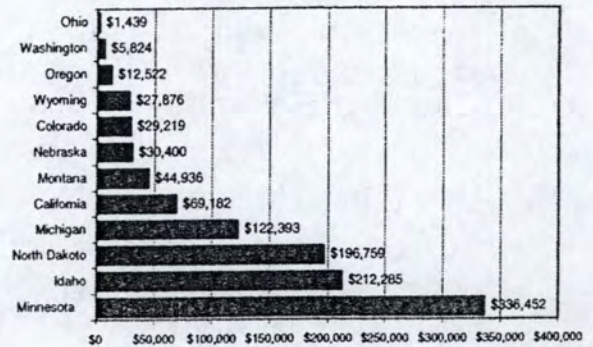


FIGURE V. U.S. POTATO SALES (\$1,000) 2003 STATE RANKINGS

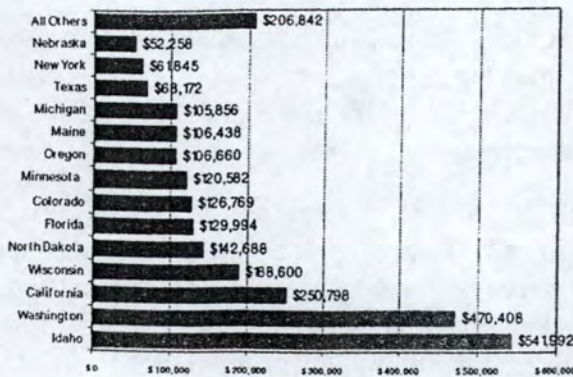
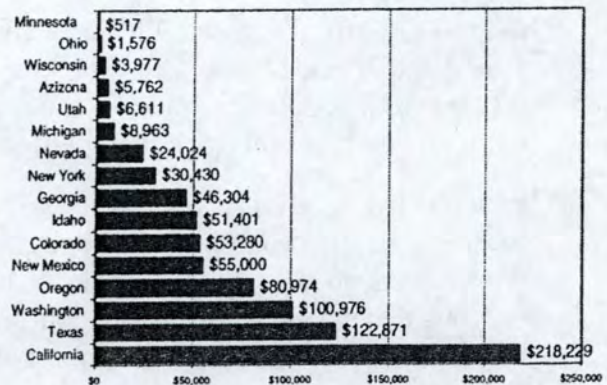


FIGURE VI. U.S. ONION SALES (\$1,000) 2003 STATE RANKINGS



An Input/Output Model of the Economy of Idaho

As indicated earlier, Table 1 reports the total sales, value-added, wages, indirect business taxes, and employment for Idaho in 2001 by major industry category. This identifies economic activity; *however*, it does not explain what drives or causes economic activity.

An export base assessment explains causation. To conduct an export base analysis of Idaho an IMPLAN input-output model of Idaho was developed and employed. A technical discussion of the model and the supporting mathematics can be found in Developing Coefficients and Building Input-Output Models (Guaderrama, Meyer, and Taylor).

Several factors determine the magnitude of export or basic activity in an economy:

- 1) The magnitudes in dollars and jobs of an export activity (sales outside the state). These are known as *direct impacts*.
- 2) The magnitudes of backward linkages (to input providers) of exporting firms. These are known as *indirect impacts*.
- 3) The magnitudes of employee and consumer spending that are linked to basic firms and input providers. These are known as *induced impacts*.

Total Economic Impacts of Sugarbeets in Idaho

The economic importance of sugarbeet production and processing on Idaho's economy was determined by completing a two-part analysis, as follows:

- 1) Estimate the sugarbeet industry's contribution to the state's economy in 2001.
- 2) Estimate the impacts on the state's economy that would result if sugarbeet production ceased in Idaho.

Idaho Economic Activity Attributable to the Sugarbeet Industry in 2001

Idaho economic activity attributable to the sugarbeet industry was estimated by removing sugarbeet production and processing (with no conversion to alternative crops) from the profile of Idaho's economy, then measuring the resulting loss of economic activity within each sector. The sugarbeet industry's total contribution to Idaho's economy in 2001 was \$1.08 billion in sales, \$338 million of value added, 7,053 jobs, \$213 million in earnings, and \$29.7 million in indirect business taxes (Table 3). These economic contributions include direct, indirect, and induced effects.

Appendix Table 1 reports the economic activity within each industry category that was attributable to the sugarbeet industry in 2001. For example, the Retail and Wholesale Trade sector experienced economic activity equal to \$64 million in sales, \$39 million in value-added, 1,058 jobs, \$26 million in earnings and \$8.7 million in indirect business taxes in 2001 that was attributable to the sugarbeet production and processing industry, and could be compared to similarly defined numbers for Idaho's entire economy or for other basic (exporting) sectors in Idaho's economy..

Estimated Impacts of Loss of Sugarbeet Production and Processing in Idaho

The second phase of the analysis involved estimation of the loss of economic activity in Idaho, should sugarbeet production and processing cease to exist in the state. Land in sugarbeet production would be converted to other crops, which would partially offset economic losses due to

the loss of the sugarbeet industry. Therefore, the loss in economic activity is not equal to simply “subtracting out” current contributions to the economy by the sugarbeet industry¹.

The impacts that Idaho’s economy would experience if sugarbeet production and processing no longer existed in Idaho are estimated to be losses of \$721 million in sales, \$163 million in value added, 3,414 jobs, \$111 million in earnings, and \$12 million in indirect business taxes (Table 3)². These numbers are less than those describing Idaho economic activity attributable to the sugarbeet industry because they were developed assuming sugarbeet land would be planted to other crops and the resulting activity would offset some of the losses associated with losing sugarbeet production and processing.

Appendix Table 2 reports estimated impacts on each industry category within Idaho’s economy associated with the disappearance of the sugarbeet industry in Idaho and conversion of production land to alternative crops. For example, the industry sector Retail and Wholesale Trade would suffer economic losses of \$24 million in sales, \$15 million in value-added, 398 jobs, \$10 million in earnings and \$3.2 million in indirect business taxes if sugarbeet production and processing ceased to exist in Idaho.

TABLE 3. ECONOMIC IMPACTS OF THE SUGARBEET INDUSTRY IN IDAHO

	Sales \$ Million	Value-Added \$ Million	Employment Jobs	Earnings \$ Million	Indirect Bus. Taxes \$ Million
IDAHO ECONOMIC ACTIVITY ATTRIBUTABLE TO THE SUGARBEET INDUSTRY IN 2001	\$ 1,084	\$ 338	7,053	\$ 213	\$ 29.7
ECONOMIC ACTIVITY THAT WOULD BE LOST TO IDAHO’S ECONOMY WITH THE LOSS OF THE STATE’S SUGARBEET INDUSTRY	(\$ 721)	(\$ 163)	(3,414)	(\$ 111)	(\$ 12.0)

Price and Production Effects on Alternative Crops

Eight crop alternatives to sugarbeets are considered in this analysis; wheat, barley, dry beans, corn grain, corn silage, alfalfa hay, potatoes, and onions. These crops are commonly grown in rotation with sugarbeets. Table 4 reports the 2000-2002 (three-year) average of the acres harvested, yield, production, price/unit, and value of production for each of the eight crops. Average total value of production of the identified alternative crops, including sugarbeets, was \$1.87 billion dollars harvested on an average 3,075,200 acres, resulting in average gross revenue calculated from all crops of \$607 per acre.

TABLE 4. SELECTED IDAHO CROP PRODUCTION AND VALUE
(INCLUDING SUGARBEETS)

Commodity	Units	2000-2002 Average Crop Acreage, Yield, Production, Price per Unit, and Value of Production				
		Harvested	Yield	Production	Price per Unit	Value of Production
		acres - 1000		1000		\$1,000
Sugarbeets	tons	193.33	26.50	5,111.67	39.47	201,322
Potatoes	cwt	378.00	357.33	135,301.67	5.18	689,596
Onions	cwt	7.70	643.33	4,952.67	10.53	52,124
Hay Alfalfa (Dry)	tons	1,166.67	4.03	4,704.67	103.67	485,431
Beans, All Dry Edible	cwt	84.67	19.83	1,682.33	19.33	32,354
Barley, Irrigated	bushels	443.83	92.17	40,907.00	2.80	114,230
Wheat, Irrigated	bushels	618.67	97.18	60,418.67	3.22	191,243
Corn for Grain	bushels	50.67	156.67	7,956.67	2.72	21,669
Corn for Silage	tons	131.67	25.17	3,314.33	24.00	79,544
Total		3,075.20				1,867,514

Source: Idaho Agricultural Statistics Service

The effects of not planting sugarbeets are difficult to predict. Long-run equilibrium of alternative crop production was assumed to be a function of current relative crop proportions (without sugarbeets) based on a three-year average. Harvested acreage of sugarbeets averaged about 193,000 acres over the three-year period 2000-2002. The absence of sugarbeets in the production mix of crops in the area would result in an estimated 6.7 percent increase in total harvested acreage of alternative crops.

The estimated increase in acreage harvested for each crop is reported in Table 5 under the heading "New Harvest". For example, potato harvest increases from 378,000 acres to 403,400 acres. Also in Table 5 is the new value of production for each crop, as well as the corresponding change in value of production, reported in the two rightmost columns. A discussion of the projected changes in production, price, and value for each of the identified crop alternatives to sugarbeets follows.

Wheat, Irrigated: Wheat production on irrigated land is projected to increase by 3.7 million bushels to 64.2 million bushels, based on current cropland allocations. Irrigated production of wheat is used as the base because sugarbeets cannot be produced on non-irrigated land. The operating costs of planting and growing wheat are relatively low, which is important to producers with limited cash and credit availability. Lending entities look more favorably upon operating loans for commodities with government price support programs because the programs reduce the risk of the loan. This contributes to increased ease of securing financing through credit. Estimating the effect of these variables is difficult, and impacts on production and revenue are likely minimal.

The price of wheat is assumed to not be affected by changed supply in Idaho because it is a commodity with a world market and government supports. Wheat is truly a global commodity, particularly for Pacific Northwest producers with easy access and relatively inexpensive transportation to global markets. When the price of wheat falls below government-specified levels,

various government programs such as the Market Loss Assistance, Loan Deficiency Payment, and the Production Flexibility Payment programs support prices.

Stable prices and increased production of wheat by Idaho producers, result in a projected increase in the value of production of Idaho wheat of \$15.3 million to \$206.6 million annually.

Barley, Irrigated: Barley production would increase by 2.7 million bushels to 44 million bushels. The price of barley is assumed to remain unchanged. The same factors that apply to wheat, apply in the case of barley. Barley competes as a feed grain in a world market, therefore changes in Idaho production will not affect price. Government programs also support barley prices. It is possible that malting facilities could use additional barley production, but limited malting capacity would be an issue. Any absorption by such facilities would serve to further stabilize the market and prices. Increased production of barley in Idaho and stable prices would result in a \$7.8 million increase in the value of production of barley to \$122 million annually.

TABLE 5. SELECTED IDAHO CROP PRODUCTION AND VALUE IF NO SUGARBEETS ARE PRODUCED

Commodity	Units	2000-2002 Average Crop Acreage, Yield, Production, Price per Unit, and Value of Production							
		Old Harvest	New Harvest	Yield	Production	Change in Production	Price per Unit	New Value of Production	Change in Value of Production
		acres - 1000	acres - 1000		1000	1000		\$1,000	\$1,000
Sugarbeets	tons	193.33	0.00	0.00	0.00	0.00	0.00	0	(201,322)
Potatoes	cwt	378.00	403.36	357.33	144133.46	8831.79	4.30	619,723	(69,873)
Onions	cwt	7.70	8.22	643.33	5285.99	333.32	9.80	51,793	(332)
Hay Alfalfa (Dry)	tons	1166.67	1244.93	4.03	5021.23	316.57	103.67	520,535	35,103
Beans, All Dry Edible	cwt	84.67	90.35	19.83	1791.87	109.54	19.33	34,643	2,289
Barley, Irrigated	bushels	443.83	473.61	92.17	43651.58	2744.58	2.80	122,079	7,849
Wheat, Irrigated	bushels	618.67	660.17	97.18	64152.50	3733.83	3.22	206,571	15,328
Corn for Grain	bushels	50.67	54.07	156.67	8470.29	513.63	2.72	23,068	1,399
Corn for Silage	tons	131.67	140.50	25.17	3536.08	221.75	24.00	84,866	5,322
Total		3075.20	3075.20					1,663,277	(204,237)

Dry Beans: Dry beans also participate in a world market. While Idaho is a significant producer of dry beans, the increase in acreage would not be enough to affect world prices. Production of dry beans is projected to increase by 83,000 hundred weight (cwt) to 1.8 million cwt, should sugarbeet production cease in Idaho. The value of production would increase accordingly by \$1.8 million to \$34.1 million.

Corn for Grain: Production of corn for grain is projected to increase by 390,000 bushels to 8.35 million bushels. Changes in Idaho production would not alter world prices. Since Idaho is a feed grain deficit region, additional corn produced in Idaho would be consumed locally by the livestock industry. Stable prices and increased production result in a projected increase in the value of

production from corn for grain of \$1.4 million annually, resulting in a total value of production for corn grain of \$23.1 million.

Corn for Silage: Corn silage production is projected to increase by 221,750 tons annually resulting in total production of corn silage in Idaho equal to 3.54 million tons, based on current crop allocations. However, corn silage must be grown near where it will be used because of the cost of transportation associated with moving such a bulky product. Therefore, it is almost always exchanged within a local market. The market for corn silage is unpredictable, therefore no change in price is assumed. A ten-year average price for corn silage of \$24/ton is used in the analysis (Patterson, Gray, Rimbey). The resulting estimated change in the value of production is an increase of \$5.3 million annually and an estimated total value of production equal to \$84.9 million.

Alfalfa Hay: Alfalfa hay is sold primarily in local markets. However, hay from neighboring states is a substitute for Idaho hay, though somewhat limited by the cost of transportation. The dairy industry of Idaho serves as the primary user of Idaho high quality alfalfa hay. Other sources of demand include the livestock feeding industry and exports, largely to other states. Export demand for Idaho hay is fairly strong because Idaho producers have a reputation for high quality. It is likely that dairies and other local users would absorb most of the additional alfalfa hay production, with the remaining quantity being consumed by the export markets (primarily other states) mentioned above.

The Idaho alfalfa hay market is difficult to predict. Recent studies of the market indicate that price is not very sensitive to increases in supply (Parish) (Pehrson). This is probably a result of high quality alfalfa hay interacting within a complex feed commodity market with many substitutes. Therefore, the analysis assumes no change in price and value of production for alfalfa hay is estimated to be \$520.5 million annually (an increase of \$35.1 million).

Potatoes: Production of potatoes is estimated to increase by 8.8 million cwt, based on current crop allocations. Idaho is a significant player in the potato market. The market identified for the purposes of this analysis is the Pacific Northwest (PNW) potato market, geographically defined as potato production in Oregon, Washington and Idaho. This market is defined based on access to similar markets. Idaho controls 52 percent of the PNW potato market and is the dominant producer. Therefore, it is assumed that changes in Idaho production of potatoes will affect potato prices.

The effects of an increase in potato production on potato prices can be measured by the price elasticity of demand, defined as the percentage change in quantity demanded of potatoes divided by the percentage change in price. Potato demand is price inelastic meaning consumers are not very sensitive to changes in prices. Wide swings in prices are required to change consumer-purchasing patterns. The effect on producers is that revenues are very sensitive to changes in quantity. Thus, an apparent paradox arises where a decrease in quantity supplied in the market can actually increase revenues; and, conversely, bountiful harvests can reduce potato revenues.

The price elasticity of demand for potatoes assumed in this analysis is -0.2 (Guenther)³. For every 1 percent that quantity increases, price falls by 5 percent. The increase in Idaho potato production represents a 3.4 percent increase in the total supply of potatoes in the PNW potato market. Applying the price elasticity to the three-year average price of potatoes of \$5.18/cwt reduces it to

\$4.30/cwt (Appendix Table 3). This causes total value of production in the state from potatoes to fall by about \$70 million from \$690 million to \$620 million, despite the increase in production (Tables 4 and 5).

Such a decrease in price would not only affect total value of production for Idaho from potatoes, it would also have a very negative effect on potato growers. Potato value of production per acre falls from \$1,824 to \$1,536 per acre (Appendix Table 5). This number is critically important to individual potato producers and their economic sustainability in the future.

Onions: Production of onions is estimated to increase by 333,000 cwt to 5.3 million cwt, given that sugarbeet production in Idaho ceases. The onion market is relatively small, and Idaho ranks sixth in production among states. Furthermore, Idaho plays an important role in the summer storage market, particularly in the Pacific Northwest (PNW). Therefore the market identified for the purposes of the price effects analysis is the PNW summer storage market. Idaho production makes up 21 percent of all onions in the PNW summer storage market.

Price elasticity of demand is again used to estimate the effects of an increase in Idaho onion production on the market price. A price elasticity of -0.2 is assumed for the purposes of this analysis (Tomek, Robinson; 1990). The increase in Idaho onion production represents a 1.4 percent increase in the PNW production of summer storage onions. Applying the price elasticity to the three-year average price of onions of \$10.53 reduces it to \$9.80/cwt (Appendix Table 4). Similar to potatoes, the onion price decrease results in a decline in farm value of production for the state from onions of \$332,000, despite increased production. Total value of production for Idaho from farm marketings of onions is estimated to be \$51.79 million if sugarbeets are no longer produced compared to \$52.1 million under the current crop production mix (Tables 4 and 5).

Decline of overall value of farm marketings is indicative of major negative impacts on individual producers. If sugarbeet production ceased in Idaho, value of production per acre of onions harvested would fall an estimated \$465 per acre from \$6,769 to \$6,303 per acre (Appendix Table 5). The long-term profitability of individual onion producers is jeopardized by such a decline in revenues.

Overall Effects on Idaho Farm Marketings

Should production of sugarbeets in Idaho cease, it would result in a revenue loss of \$201 million (the three-year average value of production for sugarbeets). Revenues from potatoes would also decline by \$70 million because of decreased price resulting from the increase in Idaho potato production. Onion prices would decline and a loss of revenues of \$332,000 would be incurred (Table 5). Revenues per acre of potatoes and onions produced would decline by \$288 and \$465 per acre, respectively (Appendix Table 5). The loss of revenue to individual producers could threaten their long-term economic sustainability.

The remaining commodities (wheat, barley, alfalfa hay, dry beans, corn grain, and corn silage) are sold in competitive markets. Increases in Idaho production would not result in changes in price. Because prices would remain stable and production would increase, the total value of production for each of these commodities would increase, and partially offset losses incurred by loss of value in

sugarbeets, potatoes, and onions. However, a net loss of total value of production equal to \$204 million dollars is estimated (Table 5).

The average value of production per acre for sugarbeets is \$1,041 per acre. In the period 2000-2002, the average value of production for all alternative crops considered, including sugarbeets was \$1.9 million on an average acreage of 3.1 million acres. So the average value of production per acre for the crops considered was \$607.28. In comparison, under the assumed new crop production mix (excluding sugarbeets), the average value of production on all acreage would be \$1.7 million. Average value of production per acre would be \$540.87 per acre (Appendix Table 5).

Note that value of production is not a profit figure and does not account for the different production costs associated with each crop. Value of production can most easily be compared to revenues from sales.

Conclusion

Sugarbeets are important to Idaho's economy. The loss of sugarbeet production would cause a significant change in the crop patterns of irrigated agriculture in Idaho. The general economy of Idaho would experience negative impacts such as loss of value-added, income and jobs. The negative impacts would be especially focused on farmers. Farm revenues would decline and farmers in southern Idaho would face increased likelihood of economic stress. Further, the prices of potatoes and onions would be depressed as acreage of those crops expanded, resulting in a loss of revenues to individual potato and onion farmers.

¹ The differences in inputs that would be used in the production of alternative crops, as compared with those used in the production of sugarbeets were assumed to be minimal. It follows from this assumption that long-run impacts of the loss of the sugarbeet industry would be the loss of sugar manufacturing and related economic activity. These impacts were simulated by running the economic model as before, but eliminating the indirect effects of sugar production (the backward linkages to sugarbeets since these lands would be producing other crops). The direct, indirect, and induced impacts for the sugarbeet manufacturing industry were held constant between the analysis of current contributions to Idaho's economy and the estimation of economic activity loss. This was done to account for complications arising from interrelationships of sugarbeet growing, manufacturing, and transportation patterns in eastern Oregon to that of Idaho. It also accounts for differences between our model parameters at the national level as compared to those at the state level.

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² These impacts do not include the price effects of changes in Idaho's agricultural production, resulting from the loss of sugarbeets.

³ Elasticity of demand given for potatoes ranges from -0.14 to -0.40. After considering the characteristics of the market defined, this analysis assumes an elasticity equal to -0.2.

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Appendix

TABLE 1. IDAHO ECONOMIC ACTIVITY ATTRIBUTABLE TO THE SUGARBEET INDUSTRY IN 2001

	Sales	Value-added	Employment	Earnings	Indirect Bus Taxes
Agriculture/Ag Processing	\$ 137,630,838	\$ 38,166,834	951	\$ 27,211,106	\$ 2,549,632
Sugar Manufacturing	\$ 576,482,154	\$ 80,681,290	1,452	\$ 60,909,680	\$ 3,680,901
Wood and Paper Manufacturing	\$ 8,966,694	\$ 3,563,193	78	\$ 2,483,740	\$ 143,370
Mining	\$ 5,659,706	\$ 2,471,045	30	\$ 1,639,401	\$ 190,405
Energy Supply & Distribution	\$ 15,718,719	\$ 8,515,606	25	\$ 3,232,062	\$ 1,644,733
Transportation and Communication	\$ 60,701,841	\$ 29,243,801	550	\$ 20,235,733	\$ 1,805,635
Construction	\$ 3,170,327	\$ 1,349,158	39	\$ 1,475,304	\$ 25,262
Manufacturing	\$ 1,103,807	\$ 372,766	7	\$ 229,364	\$ 8,323
High Tech. Manufacturing/Services	\$ 3,233,881	\$ 1,971,746	25	\$ 1,404,082	\$ 27,535
Trade -- Retail and Wholesale	\$ 63,674,191	\$ 39,139,642	1,058	\$ 26,390,925	\$ 8,651,283
Services	\$ 62,143,555	\$ 39,842,702	1,121	\$ 27,374,128	\$ 1,417,379
Publications	\$ 2,438,254	\$ 1,023,767	26	\$ 687,099	\$ 19,268
Arts & Recreation	\$ 2,679,267	\$ 1,180,759	74	\$ 957,328	\$ 60,926
Finance/Real Estate/Banking	\$ 87,819,017	\$ 58,476,129	523	\$ 11,581,329	\$ 8,486,826
Eating/ Drinking/Visitors	\$ 13,751,943	\$ 6,425,849	365	\$ 5,304,358	\$ 762,833
Private Education/Religion	\$ 1,029,500	\$ 587,869	28	\$ 606,750	\$ -
Medical Services	\$ 25,229,167	\$ 14,079,235	418	\$ 12,419,667	\$ 140,735
Recreation	\$ 1,708,572	\$ 1,106,592	48	\$ 758,687	\$ 83,745
State/Local Govt (Excluding Education)	\$ 10,358,892	\$ 9,344,997	220	\$ 7,682,426	\$ 11,102
State & Local Education	\$ -	\$ -	-	\$ -	\$ -
Federal Govt	\$ 861,434	\$ 858,272	14	\$ 735,706	\$ -
Total	\$ 1,084,361,758	\$ 338,401,253	7,053	\$ 213,318,874	\$ 29,709,890

Appendix

TABLE 2. ECONOMIC ACTIVITY THAT WOULD BE LOST TO IDAHO'S ECONOMY WITH THE LOSS OF THE STATE'S SUGARBEET INDUSTRY

	Sales	Value-added	Employment	Earnings	Indirect Bus Taxes
Agriculture/Ag Processing	\$ 10,602,897	\$ 2,940,322	73	\$ 2,096,308	\$ 196,420
Sugar Manufacturing	\$ 576,482,154	\$ 80,681,290	1,452	\$ 60,909,680	\$ 3,680,901
Wood and Paper Manufacturing	\$ 1,362,815	\$ 541,557	12	\$ 377,494	\$ 21,790
Mining	\$ 930,918	\$ 406,442	5	\$ 269,651	\$ 31,318
Energy Supply & Distribution	\$ 3,048,942	\$ 1,651,762	5	\$ 626,919	\$ 319,027
Transportation and Communication	\$ 11,540,147	\$ 5,559,597	105	\$ 3,847,055	\$ 343,273
Construction	\$ 863,409	\$ 367,431	11	\$ 401,786	\$ 6,880
Manufacturing	\$ 433,596	\$ 146,429	3	\$ 90,098	\$ 3,269
High Tech. Manufacturing/Services	\$ 1,015,337	\$ 619,067	8	\$ 440,838	\$ 8,645
Trade -- Retail and Wholesale	\$ 23,920,348	\$ 14,703,506	398	\$ 9,914,223	\$ 3,250,009
Services	\$ 18,653,328	\$ 11,959,389	337	\$ 8,216,758	\$ 425,448
Publications	\$ 841,215	\$ 353,207	9	\$ 237,054	\$ 6,648
Arts & Recreation	\$ 1,304,817	\$ 575,036	36	\$ 466,224	\$ 29,671
Finance/Real Estate/Banking	\$ 30,546,411	\$ 20,339,967	182	\$ 4,028,376	\$ 2,952,004
Eating/ Drinking/Visitors	\$ 9,281,779	\$ 4,337,082	247	\$ 3,580,140	\$ 514,869
Private Education/Religion	\$ 966,777	\$ 552,052	26	\$ 569,783	\$ -
Medical Services	\$ 24,659,480	\$ 13,761,319	408	\$ 12,139,225	\$ 137,557
Recreation	\$ 1,530,786	\$ 991,445	43	\$ 679,742	\$ 75,031
State/Local Govt (Excluding Education)	\$ 2,401,268	\$ 2,166,240	51	\$ 1,780,843	\$ 2,573
State & Local Education	\$ -	\$ -	-	\$ -	\$ -
Federal Govt	\$ 363,668	\$ 362,333	6	\$ 310,589	\$ -
Total	\$ 720,750,092	\$ 163,015,473	3,414	\$ 110,982,788	\$ 12,005,333

Appendix

Table 3. POTATO PRICE EFFECTS CALCULATIONS

	2000	2001	2002	3-year Avg
WA Potato Production*	108,000	94,400	92,400	98,267
OR Potato Production*	30,683	20,730	24,936	25,450
PNW Potato Production*	291,003	235,330	250,721	259,018
Idaho Potato Production*	152,320	120,200	133,385	135,302
Idaho Market Share	52.34%	51.08%	53.20%	52.24%
Average Price of Potatoes - ID	\$4.00	\$6.15	\$5.40	\$5.18
New Idaho Production of Potatoes*				8,831.79
% Increase in Production - PNW Potato Market				3.4%
Price Elasticity				-0.2
Percent Change in Price				-17.05%
Price Change				\$ (0.88)
New Price of Potatoes				\$ 4.30

* All production numbers are reported in 1000 cwt.

Source: Federal State Market News Service and Idaho Agricultural Statistics Service

TABLE 4. ONION PRICE EFFECTS CALCULATIONS

	2000	2001	2002	3-year Avg
WA Production of Summer Storage Onions*	8,250	8,800	8,960	8,670
OR Production of Summer Storage Onions*	10,132	9,970	10,662	10,255
PNW Production of Summer Storage Onions*	23,192	23,762	24,678	23,877
ID Production of Summer Storage Onions*	4,810.00	4992	5056	4,953
ID Market Share of Summer Storage Onions	20.74%	21.01%	20.49%	20.74%
Average Price of Onions, Idaho	\$ 11.70	\$ 8.10	\$ 11.80	\$ 10.53
New Idaho Production of Onions*				333.32
% Increase of Onion Production in Summer Storage Market				1.40%
Price Elasticity				-0.2
Percent Change in Price				-6.98%
Price Change				\$ (0.74)
New Price of Onions				\$ 9.80

* All production numbers are reported in 1000 cwt.

Source: Federal State Market News Service and Idaho Agricultural Statistics Service

Appendix

TABLE 5. REVENUE IMPACT ON PRODUCERS

Commodity	2000-2002 Average Value per Acre, Potatoes & Onions				
	Revenue/ Acre with Sugarbeets	Revenue/ Acre without Sugarbeets	Change in Revenue/ Acre	% Change in Revenue/ Acre	
Sugarbeets	\$ 1,041.32	\$ -	-\$1,041.32	-100.00%	
Potatoes	\$ 1,824.33	\$ 1,536.41	-\$287.92	-15.78%	
Onions	\$ 6,769.39	\$ 6,303.46	-\$465.94	-6.88%	
Total (avg revenue from all alternative crops considered)	\$ 607.28	\$ 540.87	-\$66.41	-10.94%	