



# Agricultural and Resource Policy Report

Colorado  
State  
University

Extension

Department of Agricultural and Resource Economics, Fort Collins, CO 80523-1172  
<http://dare.colostate.edu/pubs>

## ESTIMATED ECONOMIC IMPACT OF THE COLORADO SUGAR BEET INDUSTRY

Andy Seidl,<sup>1</sup> and Stephan Weiler<sup>2</sup>

- *Northeastern counties produce 100% of Colorado sugar beets.*
- *In 1999 the value of Colorado beet sugar production and processing was more than \$152 million and 1 thousand jobs.*

### Introduction to Colorado Beet Sugar Production

Northeastern Colorado (somewhat broadly defined) currently represents 100% of sugar beet production and processing in the state, producing some 1.5 million tons of beets in 1999. Sugar beet production and acreage shows a 15 yr increasing trend, almost doubling production and acreage over the period. Weld county is the leading beet producer in Colorado generating some 40% of annual production, planted and harvested acreage. Yuma, Morgan, Logan and Larimer counties follow Weld county, in decreasing order of harvested acreage and production (CASS 2000) (Tables 1 & 2).

Western Sugar Company operates six sugar beet processing plants in the High Plains. Two plants are located in Colorado (Greeley and Ft. Morgan), employing about 200 people full time and an additional 300 people on a seasonal basis on a payroll of about \$10 million per year. Western Sugar operates the only sugar beet processing plants in the state. In 1999, the company had contracts on about 72,000 acres with about 600 Colorado growers, or about 39% of the company's contracted acreage and about 44% of their contractors (Table 3). Western Sugar also maintains offices in Denver, which employ about a dozen full time workers on a payroll of about \$1 million per year. The Fort Morgan and Greeley processing plants process approximately 90% of Colorado sugar beet production. The remaining 10% is reportedly shipped to Nebraska or Wyoming for processing.

Sugar beet processing generates four saleable products: sugar, pressed pulp, pulp pellets and molasses. In 1999, beet products from Western Sugar's Ft. Morgan

<sup>1</sup> Assistant Professor and Extension Economist—Public Policy, Department of Agricultural and Resource Economics, Colorado State University, Ft. Collins, CO., 80523-1172. T: 970-491-7071. E: aseidl@agsci.colostate.edu.

<sup>2</sup> Assistant Professor, Department of Economics, Colorado State University, Ft. Collins, CO.

<sup>3</sup> Colorado Agricultural Statistics reports production of sugar beets in the following counties since 1996: Adams, Boulder, Kit Carson, Larimer, Logan, Morgan, Phillips, Sedgwick, Washington, Weld, and Yuma.

<sup>4</sup> The authors thankfully acknowledge Kent Wimmer, Dick Krause, Jack Fulton and Earl Lindeman for their gracious cooperation in providing Western Sugar Company data and industry expertise used in this analysis.

Extension programs are available to all without discrimination.

**Table 1: Colorado sugar beet harvested acreage, by county**

	1996	1997	1998	1999
Adams	1430	1690	1300	1480
Boulder	1200	1150	1250	1390
Kit Carson	0	0	0	60
Larimer	3070	4670	4650	5630
Logan	6440	7520	6180	7140
Morgan	12390	10900	5850	7470
Phillips	2000	5320	4920	4700
Sedgwick	60	2120	2550	3220
Washington	520	1790	1880	2670
Weld	22860	25840	22820	26700
Yuma	1130	5400	5900	8040
State	51100	66400	57300	68500

Source: Colorado Agricultural Statistics Service, 2000

**Table 2: Colorado sugar beet production (tons), by county**

	1996	1997	1998	1999
Adams	27300	34200	29800	28000
Boulder	20700	23400	22500	23800
Kit Carson	0	0	0	1300
Larimer	62300	98700	106700	115300
Logan	133000	118100	123100	143900
Morgan	249000	187300	122500	150200
Phillips	45400	117400	109800	100900
Sedgwick	1200	40500	53400	67800
Washington	12600	35100	38200	60500
Weld	456000	538900	569500	577000
Yuma	24500	114400	125500	190300
State	1032000	1308000	1301000	1459000

Source: Colorado Agricultural Statistics Service, 2000

**Table 3: 1999 Western Sugar Company contracted growers and acres**

State	Contracted Growers	Contracted Acres
Nebraska	387	61772
Colorado	598	71841
Montana	249	29630
Wyoming	136	22970
Company	1370	186213

Source: Western Sugar Company

and Greeley plants generated \$77.9 million in sales. About 92% of total sales (\$72 million) were from the sale of just less than 300,000 tons of sugar (Table 4).

Estimates of the economic impact of sugar beet production and processing on Colorado follow. Estimated impacts include economic activity in the sugar beet industry (direct impacts), activity in industries that provide goods and services to sugar beet production (indirect impacts), and activity associated with the expenditure of income earned in the direct and indirect activities (induced impacts). Total impacts are reported in terms of sales, earnings, and employment. Calculations are based upon 1999 sales data and the IMPLAN regional input output economic analysis program, which is based upon 1996 calculations.

#### **Direct, indirect, induced, and total economic impacts**

The agricultural sector generally, and the sugar beet industry specifically, represents a “basic” industry to Colorado. Basic industries provide new income to a locality by selling (exporting) goods and services to people outside of the locality. Sales of sugar, molasses, pulp pellets and pressed pulp from processed beets and the local jobs and income directly responsible for the production of sugar beet products represent the direct impact of the industry on Colorado.

The sugar beet industry also generates indirect impacts on the Colorado economy as the revenues from external sales of molasses and pressed pulp are respent in the local economy. The indirect impact of the sugar beet industry on Colorado includes the purchases of agricultural inputs and professional services used in the process of producing beets. Indirect effects represent additional economic activity driven by processed beet product sales outside of the state. These effects appear as jobs and income in local industries serving the beet

industry (e.g., accountants, fertilizer and herbicide suppliers, implement suppliers, trucking and transport).

In addition to the direct and indirect impacts of the production and sales of sugar beet products outside of the region, the beet industry is responsible for induced economic impacts in the form of the local goods and services purchased by people using their salaries and wages earned by contributing to the productivity of the beet industry. These induced expenditures translate into jobs and income for retailers, bank tellers, grocery store clerks, restaurant employees, gas station attendants and so on.

Output effects are the effects driven by the sales of processed beet products outside of the region (exports). Employment effects are the jobs created by the direct, indirect and induced effects of the sale of beet products. An estimate of the total economic impact of the sugar beet industry on the Colorado economy can be derived as the sum of its direct, indirect and induced impacts implied by export sales.

#### **Local economic impact multipliers**

The term “multiplier” is used to refer to the total amount of economic activity or impact generated by a dollar of export sales. Multipliers are commonly expressed in terms of local sales, income, or jobs generated per dollar of export sales. Direct, indirect, and induced multipliers are reported for employment and output impacts on the local economy.

Output or sales multipliers provide a measure of total sales in the local economy per dollar of external (export) sales. The output multiplier for sugar beets is 1.95 indicating that \$950,000 total sales take place in Colorado for each million dollars of sales outside Colorado. Each million dollars of direct economic activity in export sales generates \$687,000 in indirect impact and \$267,000 in induced economic activity.

**Table 4: Colorado Western Sugar Company production and value of production**

	1996		1997		1998		1999	
	Prod. (tons)	Value (\$1000)	Prod. (tons)	Value (\$1000)	Prod. (tons)	Value (\$1000)	Prod. (tons)	Value (\$1000)
Sugar	253,211	74,925	250,670	69,410	261,203	73,346	294,127	72,002
Pressed Pulp	145,653	2,185	191,720	2,588	171,224	2,055	188,834	2,266
Pulp Pellets	15,429	1,543	17,185	1,719	17,019	1,362	16,660	1,333
Molasses	32,772	2,294	58,602	4,102	53,842	2,154	57,482	2,299
<b>Total</b>	<b>447,065</b>	<b>80,947</b>	<b>518,177</b>	<b>77,819</b>	<b>503,288</b>	<b>78,916</b>	<b>557,103</b>	<b>77,900</b>

Source: Western Sugar Company

Analogously, employment multipliers indicate the number of local jobs generated per million dollars of external sales. The sugar beet industry directly or indirectly generates or induces 13.56 jobs for each million dollars of sales of processed beet products. There are 2.66 jobs in sugar processing for each million dollars of export sales. For each job in sugar processing, there are 2.55 jobs in sugar production and related activities, and 1.53 jobs in induced employment activity.

### **Calculated economic impact of sugar beets on Colorado**

Tables 5 and 6 indicate that 1999 sales of \$77.9 million worth of processed sugar beet products provided the equivalent of more than \$152 million in total impact and more than 1 thousand jobs to northeastern Colorado communities. Table 5 shows those 14 sectors of the economy affected by more than \$1 million due to the sugar industry. About 60% of the total benefits accrue directly to those in the business of sugar beet production and processing and 40% of the benefits are captured by different sectors of the Colorado economy.

Table 6 shows those 22 sectors of the economy from which at least 10 jobs can be attributed to the sugar industry. About 21% of these workers are involved in beet processing. Only about 10% of the workers employed due to the production of sugar beet products draw their wages directly from growing sugar beets. The remaining 734 employees work providing the goods and services to sugar beet operations or their employees (Table 6).

### **Summary and conclusions**

Northeastern Colorado accounts for all of the sugar beets produced in the state, and therefore, may be considered important regardless of its relative economic contribution. In 1999 the beets processed from this 11 county region were sold for almost \$80 million. These activities generated direct, indirect and induced effects on the Colorado economy. These effects have been calculated and reported in terms of output impacts and employment impacts on the industries most strongly

affected by this economic activity. The tool used to generate the estimates of these impacts is called a "multiplier."

Multipliers are imperfect measures of economic impact and changes in social welfare. However, they do provide a basis from which policy related discussion might take place. In isolation, multipliers do not indicate what the opportunity cost of using scarce resources in a particular activity is; they do not indicate the highest and best use. Estimates based upon multipliers will be imperfect because of leakages at each successive round of spending (due to imported purchases, taxes, fees, savings, and non-local beneficiaries), lack of consideration of such important issues as new construction and potential environmental impacts of the industry, and due to the fact that multipliers are not precisely calibrated using the actual situation in Colorado. In addition, not all economic activity should be interpreted as good economic activity. For example, if an industry provides a large indirect contribution to the hospital and medical industry, it may be that it is a dangerous and potentially undesirable profession to be used to spur economic development.

We estimated that in 1999 the sugar beet industry in Colorado contributed about \$152 million dollars and 1 thousand jobs to the local economy. These are large numbers standing by themselves and an essential starting point to informed decision-making. However, if this information is to be used to inform policy decisions regarding the future of this industry and the region, we recommend that more detailed analyses of this and other important regional industries be undertaken such that the relative influence of encouraging or discouraging economic development of one type or another can be fully understood.

### **Sources**

Colorado Agricultural Statistics Service (CASS) 2000. Colorado Agricultural Statistics – 2000. National Agricultural Statistics Service and the Colorado Department of Agriculture. 238 pp.

**Table 5: Economic Impact of the Colorado Sugar Beet Industry (1999) (\$ millions)**

Sector	Direct	Indirect	Induced	Total
Sugar	77,900	4,735	3	82,638
Sugar Crops	0	9,176	0	9,176
Wholesale Trade	0	7,759	1,114	8,873
Motor Freight Transport and Warehousing	0	8,176	288	8,464
Gas Production and Distribution	0	3,150	190	3,340
Real Estate	0	1,514	993	2,507
Maintenance and Repair Other Facilities	0	1,710	345	2,055
Banking	0	1,194	681	1,875
Owner-occupied Dwellings	0	0	1,593	1,593
Railroads and Related Services	0	1,243	37	1,281
Eating & Drinking	0	310	932	1,242
Other State and Local Govt Enterprises	0	869	238	1,107
Doctors and Dentists	0	0	1,091	1,091
State & Local Government - Education	0	0	1,013	1,013
<b>Total</b>	<b>77,900</b>	<b>53,493</b>	<b>20,829</b>	<b>152,222</b>

**Table 6: Employment Impacts of the Colorado Sugar Beet Industry (FTEs) (1999)**

Industry	Direct	Indirect	Induced	Total
Sugar	207.6	12.6	0.0	220.2
Sugar Crops	0.0	102.5	0.0	102.5
Wholesale Trade	0.0	73.7	10.6	84.3
Motor Freight Transport and Warehousing	0.0	81.3	2.9	84.2
Eating & Drinking	0.0	8.9	26.6	35.5
Personnel Supply Services	0.0	27.7	5.2	32.9
State & Local Government - Education	0.0	0.0	31.1	31.1
Maintenance and Repair Other Facilities	0.0	25.2	5.1	30.2
Miscellaneous Retail	0.0	5.2	21.2	26.4
State & Local Government - Non-Education	0.0	0.0	23.0	23.0
Hotels and Lodging Places	0.0	14.4	4.4	18.8
Agricultural- Forestry- Fishery Services	0.0	17.2	0.3	17.5
Credit Agencies	0.0	9.3	4.9	14.2
Food Stores	0.0	2.6	10.8	13.4
Banking	0.0	8.0	4.6	12.6
Doctors and Dentists	0.0	0.0	12.2	12.2
Hospitals	0.0	0.0	12.0	12.0
Other Business Services	0.0	8.3	2.6	10.9
General Merchandise Stores	0.0	2.1	8.6	10.7
Real Estate	0.0	6.5	4.2	10.7
Automotive Dealers & Service Stations	0.0	2.0	8.4	10.4
Accounting- Auditing and Bookkeeping	0.0	6.5	3.5	10.0
<b>Total</b>	<b>207.6</b>	<b>530.2</b>	<b>318.5</b>	<b>1,056.3</b>