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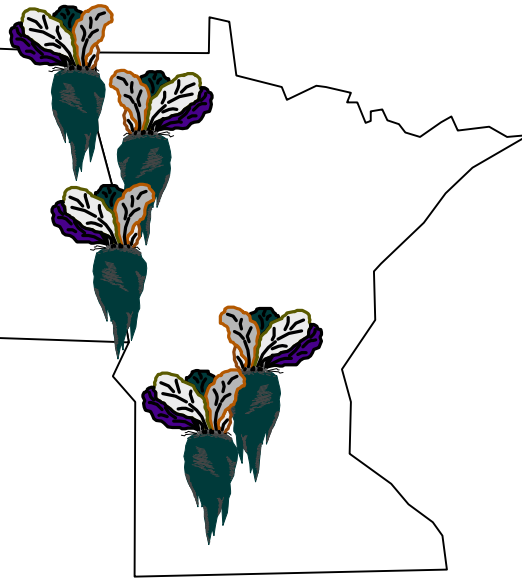
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Economic Contribution of the Sugarbeet Industry to North Dakota and Minnesota

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Agriculture has historically been an important economic sector in North Dakota and Minnesota. North Dakota's agriculture sector is dominated by crop production, while in Minnesota, crop and livestock production are more equal in importance. North Dakota typically is considered a small grain-producing state while Minnesota is among the national leaders in the production several row crops, notably corn and soybeans. In addition to many traditional crops, Minnesota and North Dakota also rank nationally in sugarbeet production. However, sugarbeets continue to be produced in a relatively small geographic area with relatively limited acreage.

Agricultural industries confined to small geographical areas with limited acreage can be overlooked by those not associated with the growing region or industry. The sugarbeet industry has been shown to be a major agricultural influence in North Dakota

and Minnesota. These factors, along with continued debate over the future of federal farm programs, help to justify a continued assessment of the economic importance of the sugarbeet industry to the regional economy. A reassessment of the industry's economic importance to the region would be helpful to (1) demonstrate the economic significance of future policy changes affecting domestic sugar industries and (2) document the economic effect of recent industry expansions.

PROCEDURES

The purpose of this study is to estimate the economic contribution of the sugarbeet industry to the North Dakota and Minnesota economy. Analysis of the sugarbeet industry required (1) estimating sugarbeet production in eastern North Dakota and Minnesota, (2) estimating expenditures and revenues from sugarbeet production, (3) obtaining

information on sugarbeet processing and marketing expenditures, and (4) using input-output analysis to determine the secondary economic impacts.

A sugarbeet production budget was used to estimate costs and returns from growing sugarbeets in the two states. The budget contained actual expenditures of farmers enrolled in the Farm Business Management Programs in each state. The sugarbeet cooperatives were surveyed to obtain estimates of their cash expenditures made to North Dakota and Minnesota entities in fiscal 1997.

Direct economic impacts are typically expressed as changes in output, employment, or income that represent the initial or direct effects of a project, program, or event. Secondary economic impacts result from subsequent rounds of spending and respending within an economy. Input-output (I-O) analysis traces linkages (i.e., the amount of spending and respending) among sectors of an economy and calculates the total business activity resulting from a direct impact in a basic sector (Coon et al. 1985). An economic sector is a group of similar economic units (e.g., communications and public utilities, retail trade, etc.).

This process of spending and respending can be explained by using an example. A single dollar from an area sugarbeet producer (*households* sector) may be spent for a bag of sugar at the local store (*retail trade* sector); the store uses part of that dollar to pay for the next shipment of sugar (*transportation* and *agricultural processing* sectors) and part to pay the store employee (*households* sector) who shelved or sold the sugar; the sugar processor uses part of that dollar to pay for the sugarbeets used to make the sugar (*agriculture-crops* sector) ... and so on.

RESULTS

The economic contribution from the sugarbeet industry was estimated from production revenues and processing expenditures, which represent the direct economic impacts of the industry. Subsequently, the direct impacts were used with an input-output model to estimate the secondary economic effects. Total business activity (direct and secondary impacts) was used to estimate tax revenues and secondary employment.

Direct Impacts

North Dakota had 7 counties in the Red River Valley that collectively produced about 3.9 million tons of sugarbeets, and Minnesota had over 20 counties that collectively produced nearly 8 million tons of sugarbeets in 1996 (Figure 1). Combined, the two states had 654,400 acres of sugarbeets and produced 11.9 million tons of sugarbeets (North Dakota Agricultural Statistics Service 1997; Minnesota Agricultural Statistics Service 1997). The region combined to produce nearly 45 percent of the nation's sugarbeet crop in 1996.

Farmers and producers generate direct economic impacts to the area economy through (1) expenditures for production outlays (e.g., hired labor, seed, fertilizer, chemicals, machinery) and (2) returns to unpaid labor, management, and equity (e.g., family labor, business investments, personal spending). Direct economic impacts from sugarbeet production (i.e., production outlays and producer returns) were estimated from crop production expenditures and from payments made to sugarbeet growers by the cooperatives.

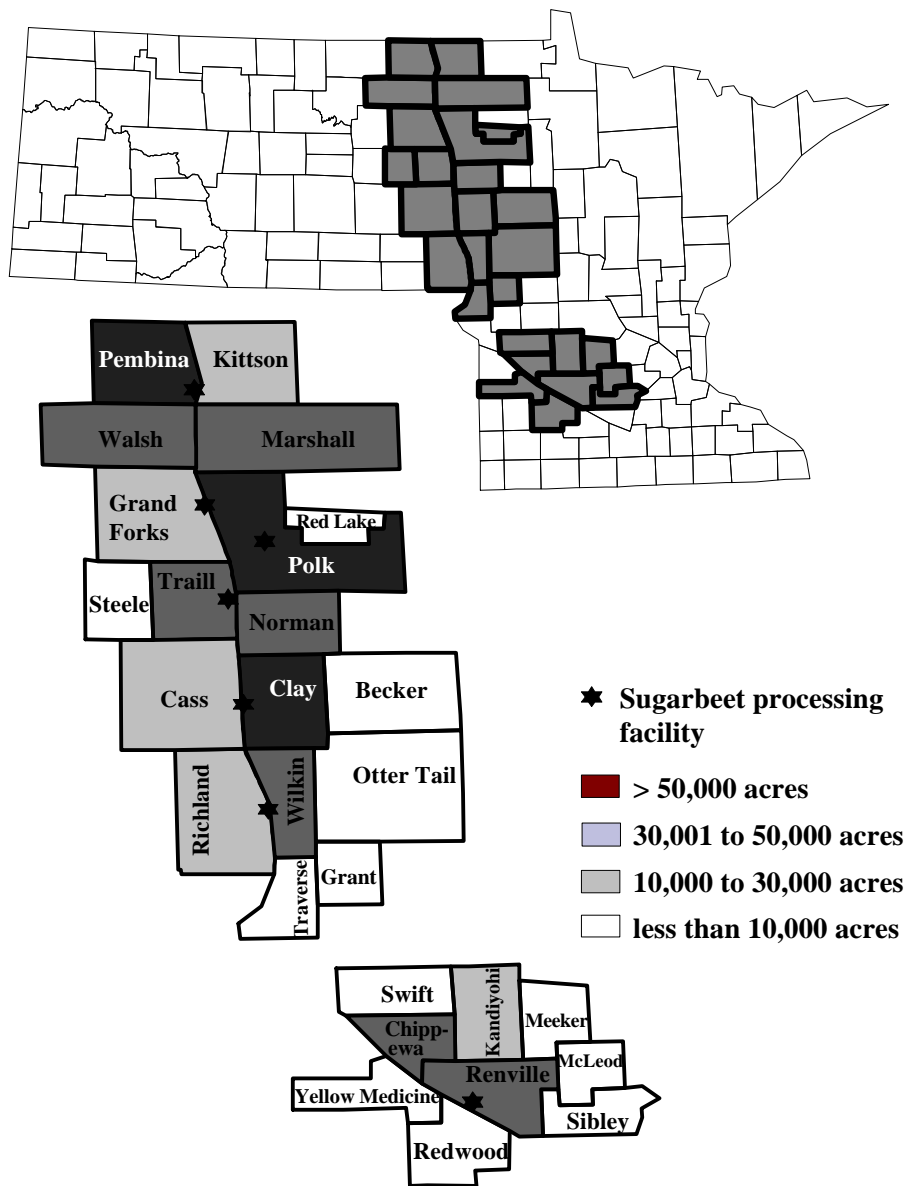


Figure 1. Sugarbeet Producing Regions, Minnesota and Eastern North Dakota, 1996

Total direct impacts from sugarbeet production in the two states were estimated at \$832.22 per acre or \$544.6 million, which included \$270 million in variable costs, \$111.3 million in fixed costs, and \$163.3 million in net returns. About two-thirds of the direct impacts from sugarbeet production were generated in Minnesota.

Sugarbeet cooperatives and their processing facilities impact local economies through operational expenditures. Based on information provided by the cooperatives, direct expenditures in the two states from processing and marketing activities were \$286.5 million in fiscal 1997, with 36 and 64 percent of the direct impacts generated in North Dakota and Minnesota, respectively.

Total direct impacts from the sugarbeet industry (production and processing) in North Dakota and Minnesota were estimated at \$831.1 million in fiscal 1997. Sugarbeet production accounted for 66 percent (\$544.6 million) of the direct impacts, while

sugarbeet processing accounted for 34 percent (\$286.5 million) of the total. Total direct impacts in Minnesota were estimated at \$535.6 million (\$164.8 million from cooperatives and \$370.8 million from growers). Total direct impacts in North Dakota were estimated at \$295.5 million (\$121.6 million from cooperatives and \$173.8 million from growers).

Secondary Impacts

Sugarbeet production expenditures, returns to sugarbeet growers, and outlays by sugarbeet cooperatives were allocated to

various economic sectors of the North Dakota Input-Output Model. Total direct impacts of \$831.1 million from the sugarbeet industry in North Dakota and Minnesota generated about \$1.5 billion in secondary impacts (Table 1).

Secondary economic impacts were greatest in the *households* (\$496 million), *retail trade* (\$452 million), *finance, insurance, and real estate* (\$100 million), *communication and public utilities* (\$73 million), and *government* (\$72 million) sectors. The economic activity in the *households* sector represents economy-wide

personal income resulting from industry expenditures and their subsequent secondary effects. Each dollar of direct impacts generated about \$1.79 in secondary impacts.

Employment

Sugarbeet cooperatives were directly responsible for 2,486 full-time equivalent jobs in 1997. Secondary employment generated by the sugarbeet industry was estimated using input-output analysis. An additional 30,436 full-time equivalent secondary jobs were generated by the

Table 1. Direct, Secondary, and Total Economic Impacts from the Sugarbeet Industry in Minnesota and North Dakota, 1997

Economic Sector	Economic Impacts of the Sugarbeet Industry		
	Direct	Secondary	Total
	----- (000s) \$ -----		
Agriculture-livestock	0	57,575	57,575
Agriculture-crops	0	32,891	32,891
Nonmetal Mining	0	5,127	5,127
Construction	52,307	53,953	53,953
Transportation	28,009	8,260	36,269
Communication and Public Utilities	15,895	72,635	88,530
Ag Proc & Misc Mnfg	17,135	46,916	64,051
Retail Trade	228,189	452,157	680,346
Finance, Insurance, and Real Estate	90,220	99,947	190,167
Business and Personal Service	26,740	38,223	64,963
Professional and Social Service	3,252	54,956	58,208
Households	349,618	496,161	845,779
Government	19,708	71,669	91,377
Totals	831,073	1,490,470	2,321,543
Direct Employment			2,486
Secondary Employment (full-time equivalent jobs)			30,436

sugarbeet industry in Minnesota and North Dakota in 1997. Secondary jobs represent employment outside of the sugarbeet industry, but employment that is created from the economic activity of the sugarbeet industry.

The number of jobs created directly from sugarbeet production would include growers and other hired labor. However, full-time equivalents were unknown and are difficult to estimate because most sugarbeet farmers also raise other crops, and if they did not raise sugarbeets, likely would remain employed raising other crops. Also, sugarbeet labor requirements are seasonal, fluctuating with weeding and harvest situations, and typically are met by employing a large number of temporary workers for relatively short periods.

Tax Revenue

Tax collections are another important measure of economic impact. In an era of reduced governmental funding, revenue shortfalls, and growing public demand on governments to balance their budgets while providing constant or increased levels of services and benefits, tax collections have become an important factor in assessing economic impacts.

Tax collections were estimated separately for North Dakota and Minnesota. Total business activity was estimated for each state by determining direct expenditures and secondary activity by state. Personal income, retail trade, and other business activity (components of total business activity), along with tax coefficients for each state, were used to estimate tax revenue.

Tax revenue generated by the sugarbeet industry in North Dakota included \$11 million in sales and use taxes, \$4 million in personal income taxes, and \$1.4 million in corporate income taxes. The sugarbeet industry in Minnesota generated \$12.7 million in sales and use taxes, \$18.9 million in personal income taxes, and \$3 million in corporate income taxes. Total tax collections from these three taxes were nearly \$51 million. The sugarbeet cooperatives and growers also paid an estimated \$12.6 million in property taxes in North Dakota and Minnesota. Property taxes were included in the direct impacts and estimated from survey and secondary information.

Industry Growth

Previous estimates of the economic size of the sugarbeet industry were compared with estimates from this study. Adjusting previous estimates of industry size for inflation revealed that the sugarbeet industry exhibited real growth (size has increased after accounting for inflation) over the last decade (Table 2). Since 1987, planted acreage and tons processed have increased 42 percent and 67 percent, respectively. Planted acreage in 1987 was about 460,000 acres, while planted acreage in 1996 increased to 654,000 acres. Correspondingly, in real terms (inflation removed), gross business volume generated by the sugarbeet industry in North Dakota and Minnesota has increased 24 percent since 1992 and nearly 74 percent since 1987. Other economic indicators also have shown real growth since 1987, such as a 72 percent increase in tax revenue generated by the industry and a 14 percent increase in direct employment within the industry.

SUMMARY AND CONCLUSIONS

The purpose of this study was to estimate the economic contribution of the sugarbeet industry to the North Dakota and Minnesota economy. Farmers and producers generate direct economic impacts to the area economy through (1) expenditures for production outlays and (2) returns to unpaid labor, management, and equity. Similarly, sugarbeet cooperatives and their processing facilities impact local economies through expenditures for processing inputs, labor, and investment in facilities and capital.

Direct economic impacts from the sugarbeet industry (sugarbeet production and processing) were estimated at \$831.1 million

in fiscal 1997. Input-output analysis was used to estimate the secondary impacts (\$1.5 billion). Total economic activity (direct and secondary impacts) was estimated at \$2.3 billion in Minnesota and North Dakota, including \$846 million in economy-wide personal income and \$680 million in retail sales. About 36 and 64 percent of the economic impacts were generated in North Dakota and Minnesota, respectively.

The sugarbeet industry employed 2,486 full-time equivalent workers and supported an additional 30,436 full-time equivalent secondary jobs in the two-state area. Also, the sugarbeet industry in 1997 generated tax collections of about \$16.4 million in North Dakota and \$34.6 million in Minnesota, and also paid an additional \$12.6 million in property taxes.

Table 2. Sugarbeet Industry Size in North Dakota and Minnesota, Selected Years

Economic Indicators	Sugarbeet Industry Activity in Various Years		
	1987 ^a	1992 ^b	1997 ^c
Gross Business Volume (nominal dollars)	985,709,000	1,635,800,000	2,321,500,000
Gross Business Volume (1997 dollars)	1,337,300,000	1,871,300,000	2,321,500,000
Direct Employment (cooperatives)	2,175	2,410	2,486
Secondary Employment	14,898	20,942	30,436
Tax Revenue Generated (1997 dollars)	29,700,000	38,400,000	51,000,000
Planted Acreage	460,000	554,400	654,400
Economic Impact per Acre (1997 dollars)	2,907	3,375	3,548
Tons of Sugarbeets Processed ^d	7,000,000	9,273,819	11,690,823
Economic Impact per Ton (1997 dollars)	191	202	199

^a Coon and Leistritz (1988).

^b Bangsund and Leistritz (1993).

^c Current figures include producer net returns, land expenses in sugarbeet production, and expenditures from associated marketing efforts. All three items were excluded from Coon and Leistritz (1988). Expenditures from associated marketing efforts (i.e., United Sugars) were excluded from Bangsund and Leistritz (1993).

^d Exact amount of sugarbeets processed was not available from Coon and Leistritz (1988).

For every dollar the sugarbeet industry spent in North Dakota and Minnesota, \$1.79 in additional business activity was generated. Each acre of sugarbeets planted generated about \$3,458 in total business activity (production, processing, and secondary impacts) or, expressed alternatively, each ton of sugarbeets processed generated about \$198 in total business activity.

Examinations of previous studies of the economic contribution of the sugarbeet industry revealed that the industry has experienced substantial real growth (inflation removed) in the last decade. Since 1987, planted acreage and tons processed have increased 42 percent and 67 percent, respectively. Correspondingly, in real terms, gross business volume generated by the sugarbeet industry in North Dakota and Minnesota has increased 24 percent since 1992 and nearly 74 percent since 1987.

The sugarbeet industry in Minnesota and North Dakota contributes substantially to the two-state economy. Not only is the dollar

volume of business activity considerable, but most processing plants are located in rural areas of the two states. This, along with the size and structure of the sugarbeet-growing area, suggests most of its economic activity affects local economies. Expenditures for crop inputs and returns to growers (*households* and *retail trade* sectors), which represent a majority of the economic activity, are evenly distributed throughout the growing area. In addition, those activities take place at the local level, enhancing rural economies. This is in contrast to some industries, which concentrate economic activity in sectors of the economy that do not generate much economic activity in rural economies. Although the sugarbeet industry in Minnesota and North Dakota is not large in terms of acres or geographic area, if measured in terms of personal income, retail sales, total business activity, tax revenue collections, and employment (direct and secondary), its economic contribution is highly apparent.



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This report is a summary of a larger report, Economic Contribution of the Sugarbeet Industry in North Dakota and Minnesota, by Dean A. Bangsund and F. Larry Leistritz, Department of Agricultural Economics, North Dakota State University, Fargo, ND 58105 (701) 231-7441. This report can also be found at <http://agecon.lib.umn.edu/ndsu.html>.

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