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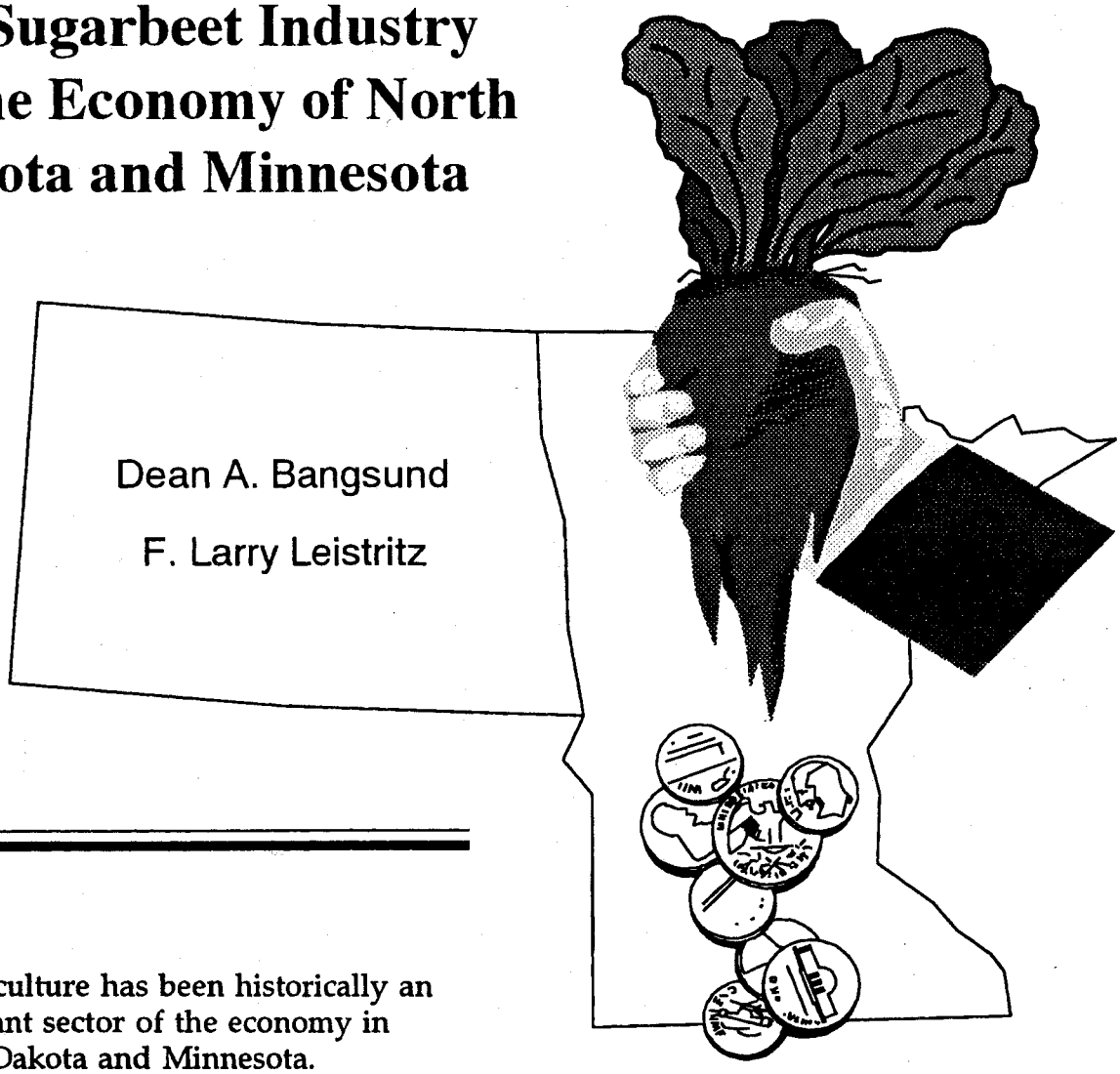
Agricultural Economics Report No. 305-S September 1993

Economic Contribution of the Sugarbeet Industry to the Economy of North Dakota and Minnesota



Dean A. Bangsund

F. Larry Leistritz

Agriculture has been historically an important sector of the economy in North Dakota and Minnesota. Agriculture comprised over 41 percent of total sales to final demand in North Dakota from 1985 to 1989 (Leistritz and Coon 1991). Correspondingly, agriculture in Minnesota, not including the forest industry, accounted for 22 percent of all out-of-state sales in 1990, or if measured in terms of overall business activity, generated 13 percent of all economic activity in the state (Senf et al. 1993).

Agriculture in North Dakota is dominated by crop production, while in Minnesota, crop and livestock production are nearly equal in importance. North Dakota typically is considered a small grain-producing

state, leading the nation in the production of nearly all small grains and ranking nationally in the production of dry edible beans, sunflowers, and potatoes (North Dakota Agricultural Statistics Service 1993). Minnesota ranks nationally in the production of corn, soybeans, sunflowers, navy beans, alfalfa hay, some small grains, and several livestock categories (dairy, turkeys, hogs, and cattle) (Minnesota Agricultural Statistics Service 1993).

However, in addition to many traditional crops, Minnesota and North Dakota also rank nationally in sugarbeet production. Minnesota has been the leading sugarbeet-producing state since 1989 and the leading state 8 out of the last 10 years, while North Dakota has been ranked fourth for the last 10 years. However, sugarbeet production is often overshadowed by the sheer acreage of small grain in North Dakota and the acreage of corn and soybeans in Minnesota. For example, in 1992, North Dakota planted 11.6 million acres of wheat and Minnesota planted 12.7 million acres of corn and soybeans, compared to only 570,000 acres of sugarbeets in the two states (North Dakota Agricultural Statistics Service 1993; Minnesota Agricultural Statistics Service 1993).

Sugarbeets, unlike most traditional crops (e.g., small grains, corn, beans), are difficult and expensive to transport long distances and have unique storage problems not found with most crops (i.e., they are bulky, require specialized handling equipment, and have limited storage life). As a result, several sugarbeet processing facilities have been established in the sugarbeet-producing areas by three producer-owned cooperatives: American Crystal Sugar Company with headquarters in Moorhead, Minnesota; Minn-Dak Farmers Cooperative located in Wahpeton, North Dakota; and Southern Minnesota Beet Sugar Cooperative located in Renville, Minnesota. Sugarbeet production is generally more capital intensive and geographically concentrated than small grains and most row crops; this, along with local processing facilities, has historically contributed to the industry's impact on the two-state economy.

PROCEDURES

The purpose of this study is to estimate the economic contribution of the sugarbeet industry to the North Dakota and Minnesota economy in 1992. Analysis of the sugarbeet industry required (1) estimating sugarbeet production in eastern North Dakota and Minnesota, (2) estimating sugarbeet production expenditures, (3) obtaining sugarbeet cooperative expenditures, and (4) using input-output analysis to generate secondary impacts.

In 1992, North Dakota had 7 counties in the Red River Valley that collectively produced about 3.1 million tons of sugarbeets, and Minnesota had over 19 counties that collectively produced about 6.8 million tons of sugarbeets (Figure 1). The two states had over 550,000 acres of sugarbeets in 1992 and produced over one-third of the nation's sugarbeet crop, with about two-thirds of the crop produced in Minnesota. The three sugarbeet cooperatives processed about 9.3 million tons of sugarbeets in 1992.

A sugarbeet production budget was used to estimate costs and returns from growing sugarbeets in the two states. The budget was based on a survey of sugarbeet growers in the Red River Valley (Johnson and Coon 1990), and adjusted to reflect 1992 production costs. The three sugarbeet cooperatives in Minnesota and North Dakota were surveyed to obtain estimates of their cash expenditures made within North Dakota and Minnesota in the last fiscal year.

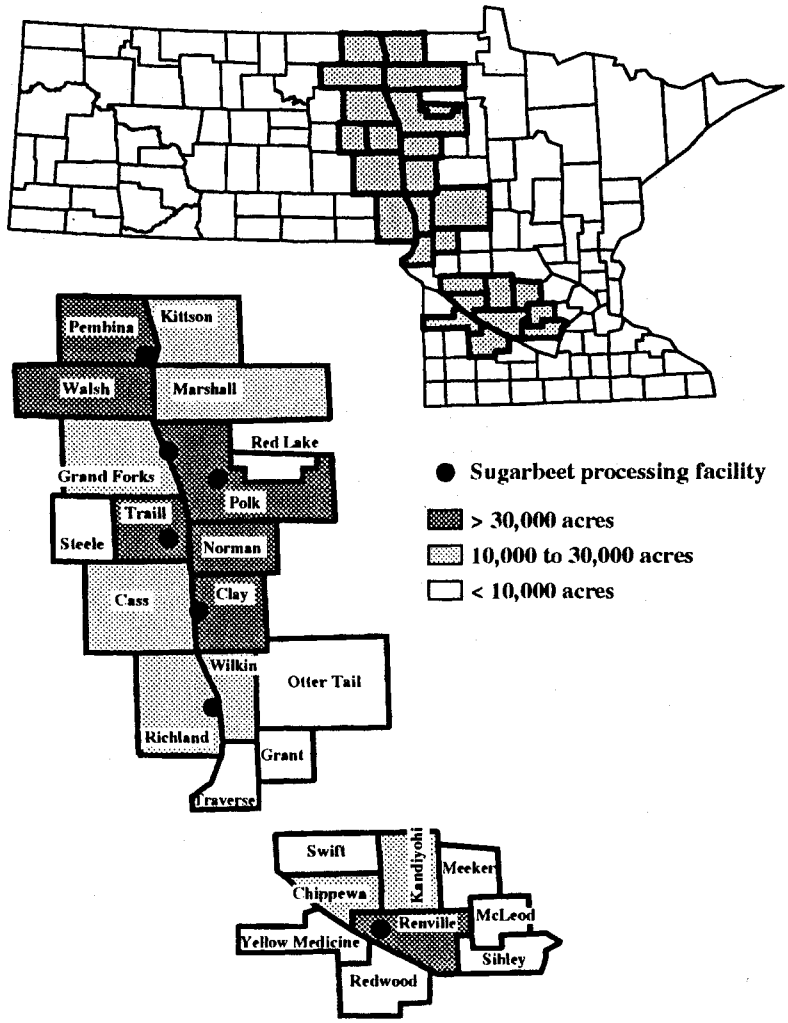


Figure 1. Sugarbeet Producing Counties and Sugarbeet Processing Plants in Minnesota and Eastern North Dakota, 1992.

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 activity. Secondary economic impacts result from subsequent rounds of spending and respending within the 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 a sugarbeet cooperative employee's paycheck (*households* sector) may be spent for a loaf of bread at the local store (*retail trade* sector); the store uses part of that dollar to pay for the next shipment of bread (*transportation* and *agricultural processing* sectors) and part to pay the store employee (*households* sector) who shelved or sold the bread; the bread supplier uses part of that dollar to pay for the grain used to make the bread (*agriculture-crops* sector) ... and so on (Hamm et al. 1993).

RESULTS

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

Direct Impacts

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, equity, and risk (e.g., family labor, land investment). Direct economic impacts from sugarbeet production (i.e., production outlays and producer returns) were estimated from a crop production budget and from payments made to sugarbeet growers by the three sugarbeet cooperatives.

Total direct impacts from sugarbeet production in the two states were estimated to be $676 per acre or $374.6 million, which included $140 million in variable cash costs, $48.5 million in fixed cash costs, $74.2 million in noncash variable and fixed expenses, $46.9 million in land expenses, and $65 million in producers' returns over costs. About two-thirds of the direct impacts from sugarbeet production were generated in Minnesota.

Sugarbeet cooperatives and their processing facilities impact local economies through expenditures for processing inputs, labor, and investment in facilities and capital. Based on survey results, direct impacts in the two states from the cooperatives were $200.9 million in 1992, with 33 and 67 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 $575.5 million in 1992. Sugarbeet production accounted for 65 percent ($374.6 million) of all direct impacts, while sugarbeet processing accounted for 35 percent ($200.9 million) of all direct impacts. Total direct impacts in Minnesota were estimated at $385 million ($133.7 million from cooperatives and $251.3 million from growers). Total direct impacts in North Dakota were estimated at $190.5 million ($67.2 million from cooperatives and $123.3 million from growers).

Secondary Impacts

Sugarbeet production expenditures, returns to sugarbeet growers, and production outlays by sugarbeet cooperatives were allocated to various economic sectors of the North Dakota Input-Output Model. Total direct impacts of $575.5 million from the sugarbeet industry in North Dakota and Minnesota generated about $1.06 billion in secondary impacts (Table 1).

Secondary economic impacts were greatest in the *households* ($332.4 million), *retail trade* ($322.4 million),

TABLE 1. DIRECT, SECONDARY, AND TOTAL ECONOMIC IMPACTS FROM THE SUGARBEET INDUSTRY IN MINNESOTA AND NORTH DAKOTA, 1992

Economic Sector	Economic Impacts of the Sugarbeet Industry		
	Direct	Secondary	Total
	---------- dollars (000s) ----------		
Agriculture-livestock	0	41,916	41,916
Agriculture-crops	0	32,894	32,894
Nonmetal Mining	0	3,208	3,208
Construction	18,861	38,543	57,404
Transportation	22,926	5,671	28,597
Communication and Public Utilities	19,139	50,429	69,568
Agricultural Processing and Miscellaneous Manufacturing	28,686	43,370	72,056
Retail Trade	141,168	322,450	463,618
Finance, Insurance, and Real Estate	30,683	71,836	102,519
Business and Personal Service	17,715	26,651	44,366
Professional and Social Service	6,393	39,409	45,802
Households	274,928	332,351	607,279
Government	15,029	51,571	66,600
TOTALS	575,527	1,060,301	1,635,828

finance, insurance, and real estate ($71.8 million), and *government* ($51.6 million) sectors. Secondary industry impacts also affected the *agriculture-crops* and *agriculture-livestock* sectors, two sectors that had no direct impacts, but had noticeable secondary impacts. The economic activity in the *households* sector represents economy-wide personal income resulting from industry expenditures and their subsequent secondary effects.

Employment

The sugarbeet cooperatives were directly responsible for 2,410 full-time equivalent jobs in 1992. Secondary employment generated by the sugarbeet industry was estimated using input-output analysis. An additional 20,942 full-time equivalent secondary jobs were generated by the sugarbeet industry in Minnesota and North Dakota in 1992. Secondary jobs represent employment outside of the sugarbeet industry, but employment that is dependent on the existence 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 federal 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 $6.0 million in sales and use taxes, $2.7 million in personal income taxes, and $0.9 million in corporate income taxes in 1992. The sugarbeet industry in Minnesota generated $7.9 million in sales and use taxes, $13.9 million in personal income taxes, and $2.2 million in corporate income taxes in 1992. Total tax collections from these three taxes alone in North Dakota and Minnesota generated by the sugarbeet industry in 1992 were about $33.6 million. The sugarbeet cooperatives and growers also paid an estimated $6.5 million in property taxes in North Dakota and Minnesota in 1992. Property taxes were included in the direct impacts and estimated from survey and secondary information.

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 in 1992. Farmers and producers generate direct economic impacts to the area economy through (1) expenditures for production outlays and (2) returns to unpaid labor, management, equity, and risk. 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 $575.5 million in 1992. An input-output model was used to estimate the secondary impacts ($1.06 billion). Total economic activity (direct and secondary impacts) was estimated to be $1.635 billion in Minnesota and North Dakota, including $607.3 million in economy-wide personal income and $463.6 million in retail sales. About one-third of the economic impacts were generated in North Dakota and two-thirds in Minnesota.

The sugarbeet industry employed 2,410 full-time equivalent workers and supported an additional 20,942 full-time equivalent secondary jobs in the two-state area. Also, the sugarbeet industry in 1992 generated tax collections of about $9.6 million in North Dakota and $24 million in Minnesota, and also paid an additional $6.5 million in property taxes.

For every dollar the sugarbeet industry spent in North Dakota and Minnesota, $1.84 in additional business activity was generated. Each acre of sugarbeets planted generated about $2,950 in total business activity (production, processing, and secondary impacts) or, expressed alternatively, each ton of sugarbeets processed generated about $176 in total business activity.

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 to the Economy of North Dakota and Minnesota, by Dean A. Bangsund and F. Larry Leistritz, Department of Agricultural Economics, North Dakota State University, Fargo, ND 58105 (701) 237-7441.

This study was funded by the Sugarbeet Research and Education Board of Minnesota and North Dakota.