



Agri

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The Economic Impact of Sunflowers on Manitoba's Economy: 2023

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Introduction

The Manitoba Crop Alliance (MCA) commissioned GlobalData to undertake research that quantifies the benefit of sunflower crops to the Canadian province of Manitoba. This benefit is assessed in terms of:

1. **Economic impact**
2. **Number of people dependent on the sector**
3. **Wages**

This study provides the results of that independent analysis.

The focus is specifically on the production of sunflower and its associated goods within the province, spanning several steps in the value chain: from the cultivation of oilseed and confectionary sunflower, its subsequent storage and processing, to the transportation of seeds and processed goods locally or to other provinces, as well as to the United States border for export.

Note that the results only consider the economic impact of sunflower produced within the province. Any imported sunflower from overseas, or other provinces, are discounted. Similarly, the results only consider the economic impact of the processing of Manitoba grown sunflower that takes place within the province. Any processing of Manitoba grown sunflower that takes place overseas, or in other provinces, is not considered in the final results.

The results capture:

1. The **direct** benefit from these stages
2. The **indirect** benefit from the associated economic activities and industries
3. The **induced** benefit from household spending of the income earned from the sunflower crop sector.

The data are presented for **Direct** benefits and **Total** benefits (the sum of the direct, indirect and induced benefits above) for each step of the value chain.

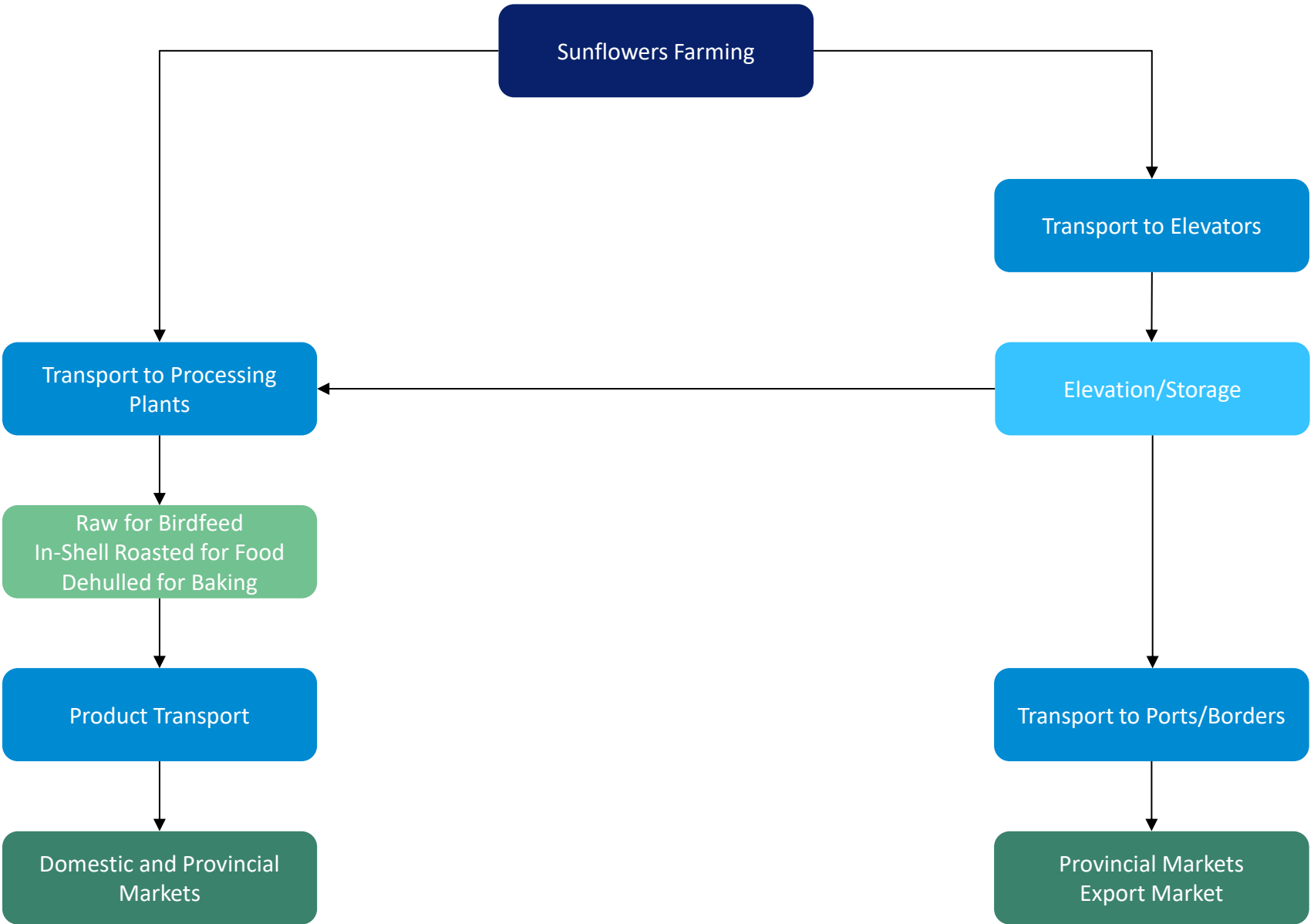
The objective is to develop an up-to-date assessment, using:

- Official data as far as possible
- The latest data for 2021/22 and previous years (which are officially revised over time)
- Interviews with industry participants
- Best practice in estimating economic benefits.

The analysis aims to provide the most accurate and independent assessment possible. To this end, we took guidance from industry participants, applied the most recent official data where relevant and used *Statistics Canada* multipliers to arrive at our totals in each category. The total results reflect the most recent multipliers for each sector.

*Note: Value throughout the study is presented in **Canadian dollars**, whether noted as dollars, or with the symbols \$ or C\$, unless otherwise specified.*

The value chain presented on the next page represents the value chain for **sunflower in Manitoba** as covered by this report.



Summary of Results

For the average of the past three years, **2019/20-2021/22**:

- The **total economic impact** on Manitoba's economy from its sunflower sector averaged C\$125 million per year and peaked in the last marketing year (2021/22) at around C\$154 million.
- Around 450 **full time equivalent jobs** are supported by the sunflower sector, comprising around 390 paid jobs and an additional 60 farm family members (beyond the growers themselves) who support and are supported by sunflower farming operations.
- The **total wage impact** of the sector averaged around C\$54 million and peaked in the past marketing year at around C\$75 million.

The sunflower sector has benefited from higher crop prices in recent years (*the 2021/22 average was 65% up on 2018/2019*). These higher prices have partly offset a slowdown in domestic production.

Farming has the largest employment impact in Manitoba's sunflower value chain, with close to 290 full time equivalent farm owners and hired workers. An additional 60 farm family members both support and are supported by sunflower farming operations.

The report is structured as follows:

- **Part A** of the report focuses on the results, which are presented based on an average of 2019/20-2021/22 data across all stages of Manitoba's sunflower value chain.
- **Part B** of the report outlines the methodology for each stage of the value chain in more detail.

Part A. Manitoba Results – Overview

This study evaluates the impact along the value chain for sunflower via three different metrics:

- **Economic impact:** quantifies the value added to the Manitoba economy by its sunflower sector
- **Employment impact:** estimates the number of full-time equivalent (FTE) jobs contributed by the sunflower value chain in Manitoba
- **Wage impact:** evaluates the sum of all wages for individuals employed on a FTE basis in the value chain

We evaluate Manitoba's sunflower value chain at several distinct steps, tracing the impact from cultivation through the value-added processing sectors.

- In each case, our analysis ends at the point where the sunflower is transported, either as a raw material or as a processed good, within Manitoba or to another province for domestic consumption, or when it crosses Manitoba to the United States as an overland export.

The economic indicators for each step of the value chain are presented at two levels: **Direct effects** only, and **Total effects** (which is the sum of Direct, Indirect and Induced effects, as below).

- **Direct effects:** the economic, employment and wage impacts that can be directly attributed to the sunflower value chain. These results are calculated by GlobalData based on models driven by publicly and privately available data, industry knowledge, and interviews with industry stakeholders.
- **Indirect effects:** the economic, employment and wage impacts created by those industries that supply the sunflower value chain, or by individuals who work at the periphery of the sector.
- **Induced effects:** the economic, employment and wage impacts that stem from household spending of the income earned from the sunflower sector.

Note: The indirect and induced effects of the sunflower sector are estimated based on input-output tables developed by Statistics Canada (StatCan). The use of these multipliers is discussed in greater detail later in the study.

Table 1: Sunflowers economic impact assessment by value chain component

Value chain component	Description	Economic impact	Employment	Wages	Multiplier used
Sunflower farming	Production of sunflower by farmers using land and inputs such as seed, fertilizers and crop protection	yes	yes	yes	yes
Farm family members	Unpaid family members who may indirectly support farm operation. Paid family members would be captured in the sunflower farming stage	captured in sunflower farming	yes	captured in sunflower farming	no
Elevation	Primary elevation of sunflower	yes	yes	yes	yes
Crop delivery	Delivery of crop to elevators, processing plants locally in Manitoba and other provinces, or to point of export via truck.	yes	yes	yes	yes
Processing	Processing seed for human consumption or bird feed	yes	yes	yes	yes
Product delivery	Delivery of processed sunflower to local end users by truck, or to other provinces by rail	yes	yes	yes	yes

The direct impact of sunflower on Manitoba's economy

- Between 2019/20 and 2021/22, **the direct economic impact of the sunflower sector on the local Manitoba economy averaged C\$60 million** (Table 2). This value peaked in the past marketing year at around C\$73 million, with support from very high crop prices.
- The farming sector drives much of the **direct employment impact** in the sunflower value chain. Variation in sunflower sector employment is largely driven by the annual variation in planted area. Out of almost 170 full time equivalent jobs across the whole sunflower value chain, close to 75% of these are in the farming sector.
- When additional sunflower farm family members – who contribute to the overall success of the farming enterprise – are included in the overall direct employment impact figure, **the average number of people supported by the sunflower industry increases to around 230**.
- Between 2019/20 and 2021/22, **the direct wage impact of sunflower on the local Manitoba economy averaged above C\$17 million** (Table 4). This value peaked in 2021/22 at C\$24 million.

Diagram 1 below illustrates the **direct** impact of sunflower to the local Manitoba economy. The diagram presents the aggregate results for the entire value chain according to our three separate measures: *economic impact*, *employment* and *wage impact*. The data for each measure, broken down by each stage in the value chain, are presented in Tables 2-4.

Diagram 1: Direct effects of sunflower on Manitoba's economy

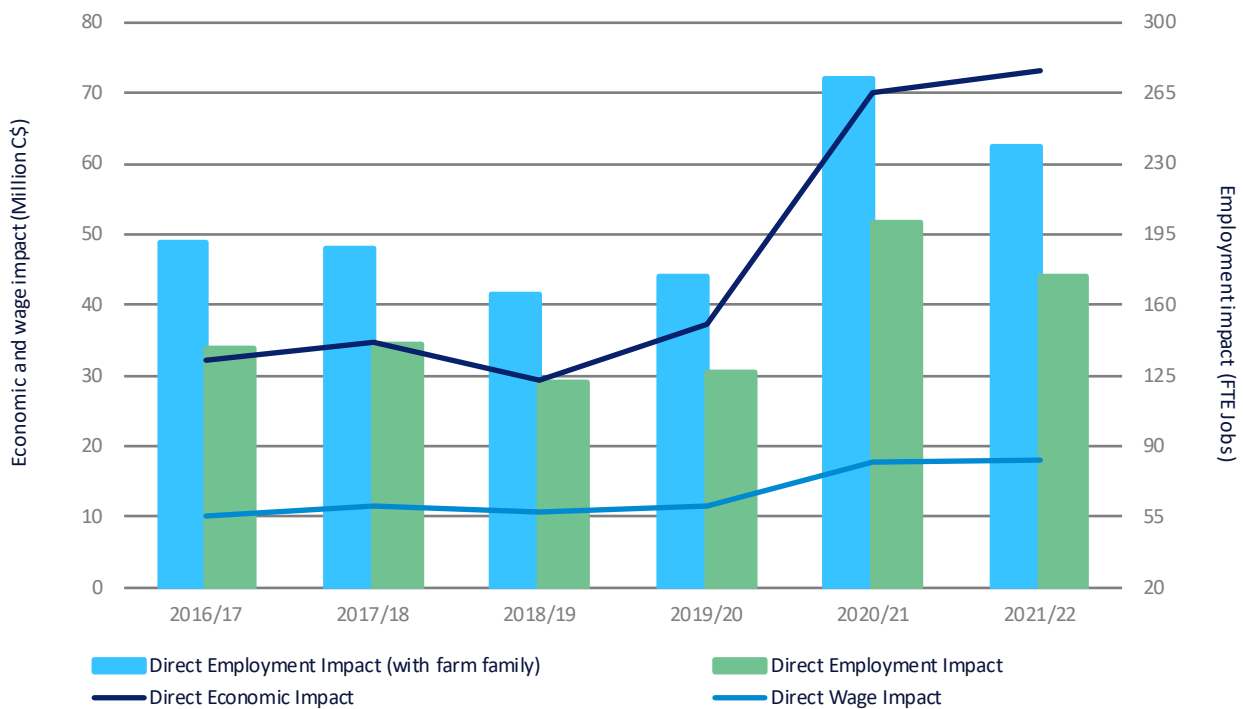


Table 2: Direct economic impact of sunflower on Manitoba's economy (C\$ million)

	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Average 2019/20 - 21/22
Farming	28.16	30.16	25.69	33.36	62.98	66.67	54.33
Elevation	1.14	0.81	1.03	0.94	1.20	1.03	1.06
Crop delivery	0.48	0.34	0.58	0.71	0.94	0.77	0.81
Processing	1.78	2.34	1.53	1.64	3.69	3.91	3.08
Product delivery	0.61	0.93	0.65	0.60	1.22	0.98	0.93
Direct Economic Impact	32.17	34.59	29.48	37.24	70.02	73.36	60.21

Table 3: Direct employment impact of sunflower on Manitoba's economy (jobs)

	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Average 2019/20 - 21/22
Farming	104	96	89	96	144	128	123
Elevation	3	2	3	3	3	4	3
Crop delivery	1	1	2	2	3	2	3
Processing	20	28	18	17	34	27	26
Product delivery	10	13	9	9	17	13	13
Direct Employment Impact	139	141	121	127	201	175	167
<i>Additional farm family members</i>	52	48	44	48	71	64	61
Direct Employment (with farm family)	191	188	166	174	272	238	228

Table 4: Direct wage impact of sunflower on the Manitoba's economy (C\$ million)

	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Average 2019/20 - 21/22
Farming	9.5	10.1	9.3	8.1	14.5	21.0	14.5
Elevation	0.17	0.14	0.21	0.21	0.18	0.25	0.21
Crop delivery	0.06	0.06	0.12	0.12	0.18	0.12	0.14
Processing	1.16	1.67	1.13	1.06	2.11	1.75	1.64
Product delivery	0.58	0.82	0.59	0.63	1.19	0.89	0.90
Direct Wage Impact	11.49	12.77	11.38	10.16	18.13	24.05	17.45

The total impact of sunflower on Manitoba' economy (direct + indirect + induced effects)

The total effect of sunflower on the Canadian economy is not limited to the people working directly in the industry. The full impact also accounts for the indirect and induced effects that occur. The results of the total impact (direct + indirect + induced effects) are presented in Tables 5-7.

- In 2021/22, the total **economic impact**, which includes direct, indirect and induced effects, peaked at around C\$154 million. The average economic impact of sunflower on Manitoba over the past three years of full data, 2019/20 and 2021/22, was around **C\$125 million**.
- The total **employment effect** of sunflower between 2019/20 and 2021/22 averaged around 450. This includes sunflower farm family members.
- Over the same period, the **wage effect** of sunflower on the local Manitoba economy averaged around **C\$54 million**.

Table 5: Total economic impact of sunflower on Manitoba's economy (C\$ million)

	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Average 2019/20 - 21/22
Farming	54.49	55.89	52.61	68.32	128.97	136.53	111.27
Elevation	1.96	1.41	1.83	1.67	2.13	1.83	1.88
Crop delivery	1.43	1.38	0.98	1.67	2.05	2.72	2.14
Processing	4.23	5.60	3.72	3.97	8.94	9.49	7.47
Product delivery	2.55	1.77	2.68	1.88	1.72	3.51	2.37
Total Economic Impact	64.67	66.05	61.82	77.50	143.81	154.08	125.13

Diagram 2: Total effect of sunflower on the Canadian economy

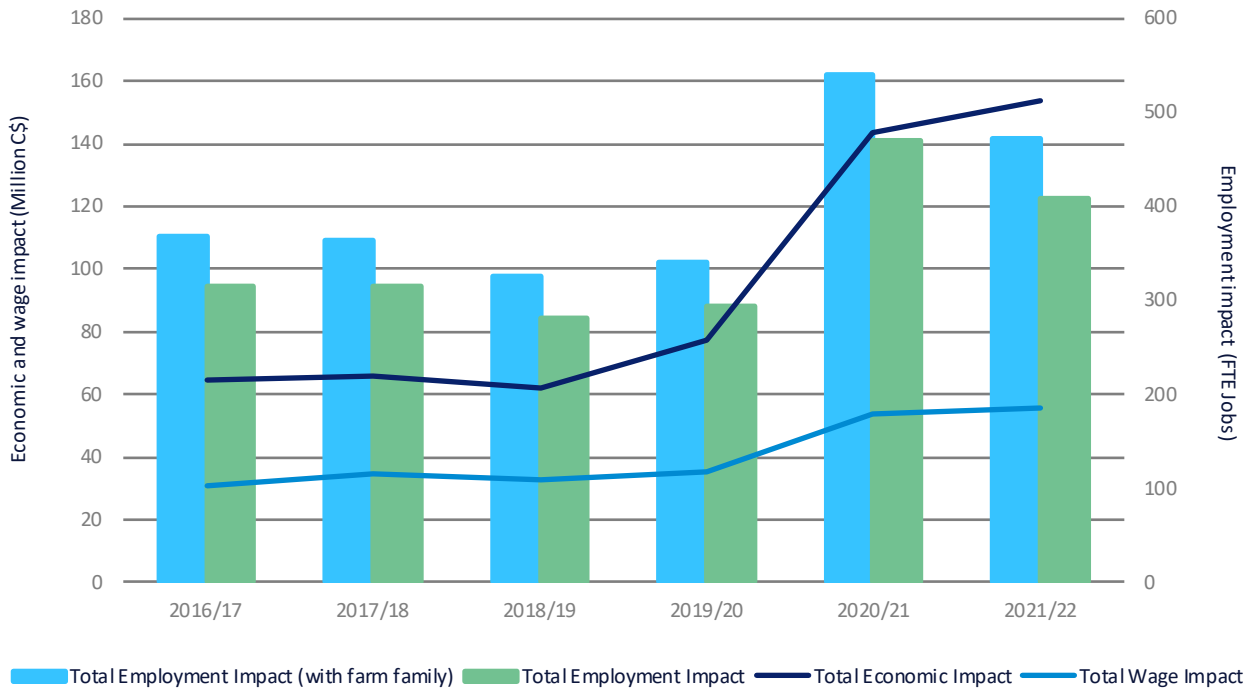


Table 6: Total employment impact of sunflower on Manitoba's economy (jobs)

	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Average 2019/20 - 21/22
Farming	233	211	207	224	336	300	287
Elevation	5	4	5	4	5	6	5
Crop delivery	0	0	0	0	0	0	0
Processing	55	70	48	44	89	71	68
Product delivery	24	31	21	21	40	31	31
Total Employment Impact	316	316	282	294	470	408	391
<i>Additional farm family members</i>	52	48	44	48	71	64	61
Total Employment (with farm family)	368	364	326	342	541	472	451

Table 7: Total wage impact of sunflower on Manitoba's economy (C\$ million)

	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Average 2019/20 - 21/22
Farming	31.70	32.85	30.61	26.72	47.39	68.96	47.69
Elevation	0.26	0.22	0.32	0.31	0.28	0.38	0.32
Crop delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Processing	2.81	3.91	2.75	2.57	5.14	4.26	3.99
Product delivery	1.17	1.61	1.15	1.23	2.33	1.74	1.77
Total Wage Impact	35.94	38.59	34.83	30.83	55.14	75.34	53.77

Part B. Methodology for deriving direct and total impact of Manitoba’s sunflower value chain

This section presents the methodology applied in deriving direct and total economic, employment and wage impacts across the distinct steps of Manitoba’s sunflower value chain. It begins with an outline of how the multipliers are derived, before delving into the various steps of the value chain.

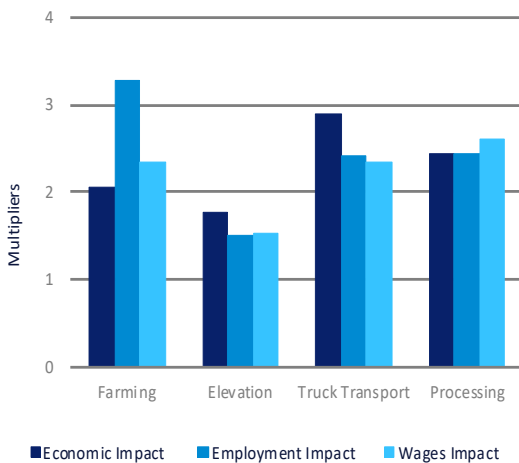
Multipliers

The **direct effects** of sunflower ignore the additional effects the industry generates in Manitoba via a ripple effect on supporting industries. This is known as the **indirect effects**. For some steps in the sunflower value chain, the indirect effect can be significant, particularly in capital intensive sectors such as processing. This is because many jobs associated with keeping a facility operational — from white collar jobs in engineering to trade professions like electricians, plumbers and pipefitters — are done on a contractual basis with outside firms, making the true impact of the processing facility much higher.

Similarly, direct effects fail to capture the economic activity stemming from expenditures of households drawing a salary from a given sector. While these “**induced**” effects are typically smaller than indirect effects, they can still constitute a sizeable economic force, particularly in a local area.

These economic and employment spin-offs are known as the **multiplier effect** in established economic literature. Multipliers measure the impact on the broader economy from an exogenous shock to a specific sector of the economy. In this report, we employ different multipliers for the economic, employment, and wage effects, and the size of the multiplier effect also varies across different subsectors of the sunflower value chain. Fortunately, *StatCan maintains industry multipliers at a detailed sectoral level.*

Diagram 3: Sunflower multipliers by steps in the value chain



Statistics Canada’s Industry Accounts Division has estimated over 250 economic multipliers. *We adopt national-level multipliers throughout when estimating the total impact of sunflower on the Manitoba economy.*

This ensures consistency with existing economic impact studies. The multipliers are available for each of our impact measures, i.e. 1) economic impact, 2) employment impact and 3) wage impact, at the direct, the direct+indirect, and the direct+indirect+induced levels (Diagram 3).

One challenge associated with using multipliers for sophisticated economies is that multipliers can change over time to reflect not only new economic realities, but also methodological developments. Also, constructing multiplier tables is both data and labour-intensive, resulting in infrequent reporting. As of the time of writing, the most recent multipliers available were from 2018 (Table 8).

Table 8: National-level multipliers derived from StatCan input-output tables

Value-added activity	StatCan Industry Designation	Multipliers		
		Economic Impact	Employment Impact	Wages Impact
Farming	<i>Crop Production</i>	2.05	3.28	2.34
Elevation	<i>Warehousing and Storage</i>	1.77	1.51	1.53
Truck Transport	<i>Truck Transportation</i>	2.89	2.41	2.35
Sunflowers processing	<i>Other food manufacturing</i>	2.43	2.43	2.60

Sunflower farming

We determine the economic impact of sunflower farming in Manitoba by considering the **sunflower revenues** earned by farmers; *i.e. volumes produced multiplied by prices received*.

Unlike the other sectors in our analysis, *this calculation does not estimate the value added by the sector*: to do this, we would have to subtract the prices of farm inputs to derive a sunflower farming gross margin. However, if we did that, we would fail to capture the economic impact of the wide array of inputs used in sunflower farming, such as seed, fertilizers and crop protection. To include these would necessitate a multitude of value-added calculations for each input into sunflower farming.

The best way to view the sunflower **farming impact** in this report, therefore, is to view it as **a summation of all the value added by all the sectors up to and including the farming stage**.

The value of sunflower farming is determined by two main factors:

- **Sunflower prices:** We use local, ex-farm Manitoba oilseed and confectionary sunflower price series, provided directly by the Manitoba Crop Alliance (MCA).
- **Sunflower output:** We use planted area and production series provided by StatCan and by MCA.

Diagram 4: Ex-farmgate Manitoba oilseed and confectionary sunflower seed prices

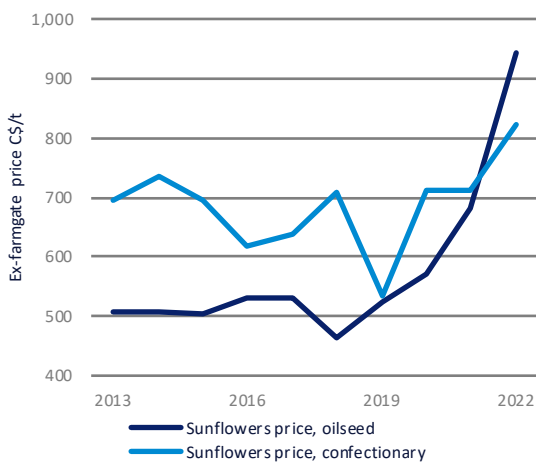
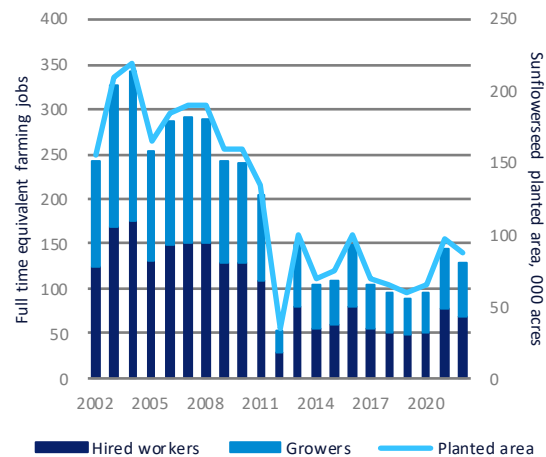


Diagram 5: Manitoba sunflower direct farming jobs and planted area



For this study, we took full-time equivalent paid sunflower farm employment to be a combination of **growers and paid labour**. While many growers may hire an immediate family member (such as a son or daughter), we assumed that hired labour was primarily found outside the immediate family. The employment effect on unpaid family members is captured in the next section.

Estimating **grower employment** in sunflower farming was made on the basis of the sunflower area in Manitoba as a proportion of the total field crop area in the province. This percentage was then applied to the total number of field crop farms in Manitoba, assuming that there is one full time farmer per farm. This last data series is constructed every five years, with the last data from 2021/22.

Sunflower's share of farm earnings was used to represent a grower's **sunflower wage**. Sunflower earnings were based on the average farm earnings for grain and oilseed farmers, from a data series available from StatCan. To account for the sunflower share of those earnings, we divided average sunflower acreage per farm by the average farm size.

Estimates for **hired labour** were based on crop budgets developed by agricultural ministry extension specialists from across the prairie provinces. While there was some variability in these budgets in terms of labour requirements, the data was fairly tightly clustered at around 1.6 man-hours per acre. By multiplying the number of sunflower acres by 1.6 and dividing by 2,000 (50 weeks x 40 hours/week), we arrived at the number of hired hands working on sunflower farms on a full-time basis annually.

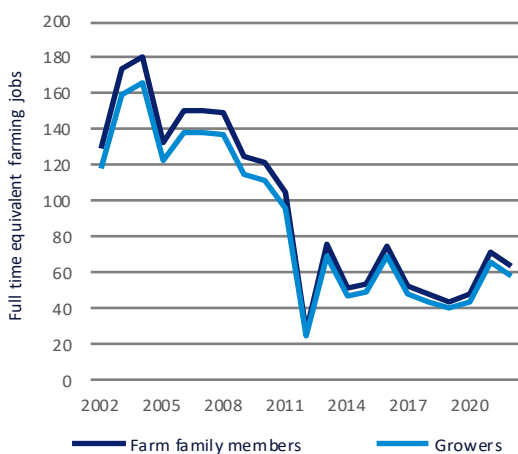
Wages for hired labour were also taken from StatCan, with total wages paid being the product of the number of hired workers and the prevailing wage.

Farm family members

Estimating the employment impact of an agricultural commodity presents the added challenge of how to account for farm family members other than the growers themselves. In some families, spouses and children may provide just a supporting role in farm operations, be it through keeping the books, buying supplies, or providing labour on an occasional basis. For other families, however, spouses and grown children may work on a nearly full-time basis, supported by farm revenues and, in the case of grown children, possibly working with a view to ultimately acquiring the farm from their parents.

To account for this impact, we have included a sub-category in our employment estimates for **sunflower farm family members**. As labour that is unpaid in the traditional sense, this category is differentiated from the rest of our employment estimates across the sunflower value chain, which represent workers who draw a cash wage from working in the sunflower sector. Consequently, the total employment effect in this study is presented with and without this number. Note that the figure provides an estimate of the additional farm family members supported by sunflower production: *it is not intended as an estimate of the family members employed by sunflower activities on the farm*. Any family members formerly employed on the farm and drawing a wage will be captured in the "hired labour" category of farm employment.

Diagram 6: Sunflowers farmers and farm family members



A number of data sets detail the average size of Canadian families over time, maintained by StatCan. One series suggests an average Canadian farm family size of 3.1 resident persons. Using this series would, therefore, imply that for every grower, there are just over two additional farm family members. These family members are supported by *all* crops grown on the farm, and therefore we assume just over one farm family member is supported by each full time (FTE) sunflower farmer. Because these family members are assumed to be uncompensated through wages, **no indirect or induced multiplier has been applied to this group and totals are the same whether looking at direct or total impacts.**

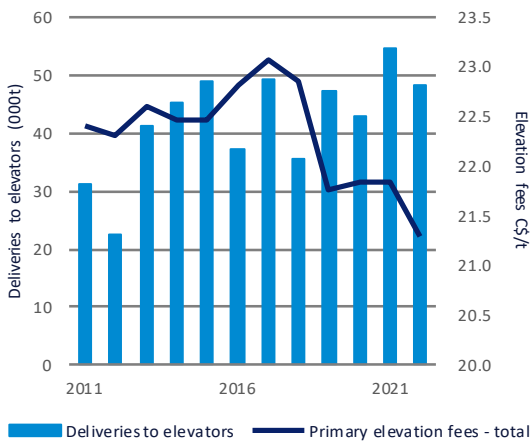
Lastly, we note that the economic impact associated with these family members is captured under sunflower farming to the extent they contribute to farm incomes.

Elevation

The economic impact of sunflower elevation was determined by the product of volumes of sunflower being elevated and the fees incurred for elevation. For Manitoba, elevated sunflower volumes were determined by data available through the *Canadian Grain Commission* as well as conversations with industry experts.

- We estimate around 50,000 tonnes of sunflower pass through elevator facilities in Manitoba. These elevators can be located at processing plants or could be stand alone facilities.
- Fees for primary elevation were also obtained from the *Canadian Grain Commission* based on annual surveys they conduct on the costs of moving grain to point of export. Total fees for receiving, removal of dockage and storage of Sunflowers, typically average from \$22 per tonne over the period.

Diagram 7: Sunflowers deliveries to elevators and total elevation fees



To understand the employment impact of sunflower elevation, we began with a “Working in Canada” report developed by the Canadian government. This identifies 6,250 individuals employed in the elevation of all agricultural commodities in Canada.

The sunflower share of this total was calculated by multiplying the total jobs figure by the ratio of sunflower in commercial positions over all grains in commercial positions.

Salaries for these positions were based on a StatCan series for jobs in grain processing and handling.

Crop and product delivery

The value added from sunflower transport comprises:

- **Crop delivery:** transporting the crop from the farm to elevators and primary processors, plus transporting the crop interprovincially to processors and ports for overseas export, as well as transporting the crop overland for export directly to US borders.
- **Product delivery:** transporting raw birdfeed and roasted food sunflower, and dehulled sunflower to distributors/retailers within Manitoba and inter-provincially, as well as overland to US borders.

With near-infinite combinations of farm origins and end-use destinations, determining the economic impact of transportation of sunflower and its products is the most complicated aspect of our economic impact model. Many assumptions have to be made on modes of transport used, average transport distances and volumes moving along each route.

For rail and trucking transport:

- The first step is to determine the transport mode employed for each type of sunflower delivery. Through interviews with industry experts, we identified that the lion’s-share of crop and product deliveries are conducted by truck from Manitoba. This includes deliveries from the farm to elevators/processors, other provinces and to the US border, with negligible volumes delivered by rail.
- The next step is to compile a distance matrix between the centers of sunflower production, sunflower processing and points of export (port facilities and US borders).

Note: The overseas exports category is zero for Manitoba as no sunflower is exported by seaport within the province, and shipments to the United States are transported overland by truck.

Because sunflower transport networks are nationwide rather than being fixed at a single point, **transportation effects are presented on the basis of where the sunflower originates**. Thus, if Manitoba sunflower is transported by truck to another province, then Manitoba captures all of the delivery benefits accrued in our model.

Trucking

Trucking sunflower and its products was dealt with as follows:

- **Sunflower volumes trucked from farm to elevator/processor** were based on the volumes of sunflower passing through elevators, as well as the volumes of sunflower processed locally in Manitoba (see next section). These data were obtained in part from StatCan and the Canadian Grain Commission.
- **Unprocessed sunflower** that does not pass through a primary elevator/processor in Manitoba or Canada is also accounted for in **volumes trucked overland for export to the United States**. No sunflower is exported from Manitoba using the ports (Churchill) within the province.
- **Processed sunflower** is assumed to be trucked locally to retail markets within Manitoba or inter-provincial markets outside of Manitoba. The proportion of processed sunflower trucked locally vs. inter-provincially is based on estimates provided by industry experts.

The average distance trucked from farm to elevator was determined by dividing the number of square miles of sunflower planted by the volume of sunflower harvested.

Distances for sunflower trucked directly from farm to elevators/processors, and from there to retailers, were determined using the average distances between the geographic centers of production and elevation/processing facilities, and then average distance of geographic centers of processors to large urban retail markets.

Volumes were multiplied by distances to arrive at a figure in tonne-miles. This, in turn, was multiplied by a tonne-mile trucking rate sourced from StatCan to derive a final trucking expenditures number.

Diagram 8: Trucked crop delivery volumes and rates to elevators/processors and the US border

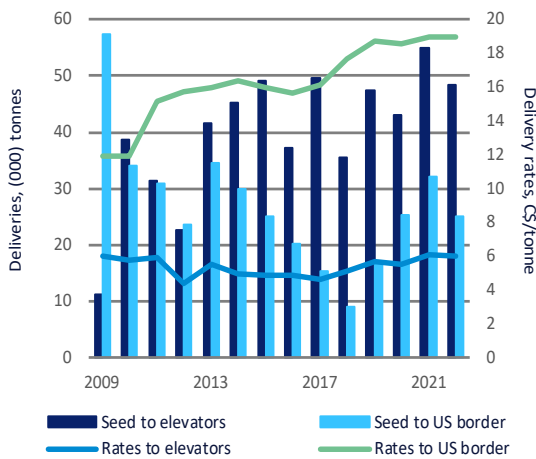
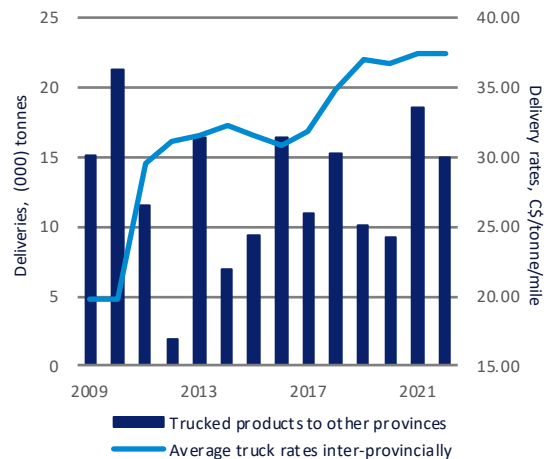


Diagram 9: Truck volumes and rates for sunflower products delivered to other provinces



The direct **employment** impact of sunflower trucking was calculated from the tonne-miles of sunflower delivered by truck. This was converted to a full-time employment impact by assuming that a typical truck (with one driver):

- Transports 18 tonnes of cargo
- Averages 35-40 miles per hour
- A full-time trucker drives 2,000 hours per year
- Trucking wages were obtained from StatCan data.

Processing

The economic impact of the sunflower processing sector is determined based on the value it adds from the production of roasted/raw sunflowerseed for the food/birdfeed sectors, and dehulled seeds for the bakery sector; all from sunflower crops grown in Manitoba. *There is no sunflowerseed crushing for oil and meal products in Manitoba.*

The volume processed in Manitoba is calculated as the residual of Manitoba production after exports, given that negligible sunflower is transported to other provinces after the harvest. To arrive at the value added from processing, the product of the farmgate price and the volume of sunflower used in processing is subtracted from the product of the retail price and the volume of finished goods processed.

Industry experts identified that the value added for processed sunflower goods in Manitoba varies depending on the good being produced, with birdfeed typically having the lowest margin and dehulled bakery seeds having the highest. At the same time, we allow for the significantly higher volume of birdseed processed relative to roasted food and dehulled bakery seeds in our calculation of the overall value added from processing.

The **employment** impact of sunflower processing was determined via discussions with employees of major processors on the average number of full-time equivalent factory workers required to produce a given volume of finished product.

The average **wages** for employees of processing facilities were obtained from StatCan data.

Diagram 10: Share of output from Manitoba's sunflower processing

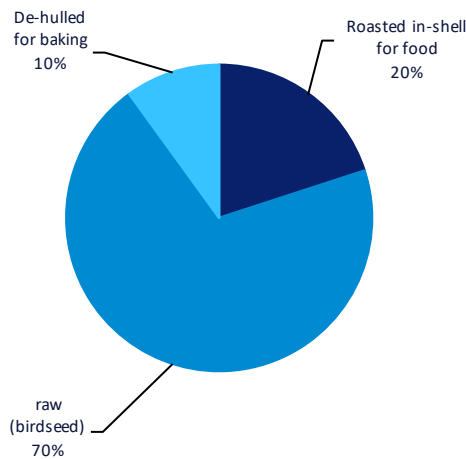
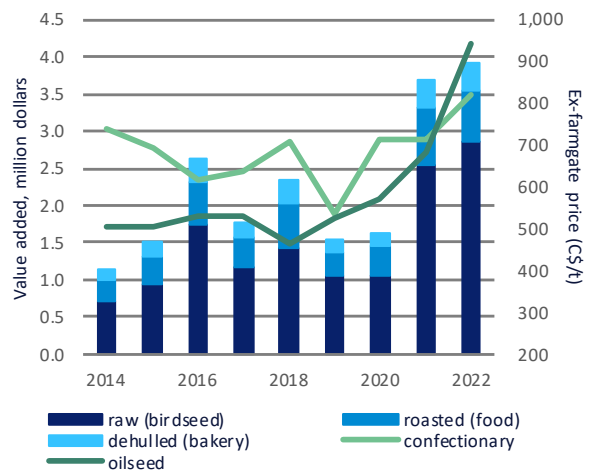


Diagram 11: Estimates of processing value added and ex-farmgate sunflower prices



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