GEORGE MORRIS CENTRE

Canada's Independent Agri-Food Think Tank

Ontario Pedigreed Seed Industry Economic Impact Study: An Update

Attention: Harold Rudy, Ontario Seed Growers' Association

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1.0 Introduction and Background

In 2002, the George Morris Centre completed an economic impact study of the pedigreed seed industry in Ontario. More than 10 years have passed since that study was completed, and in the interim, crop yields, commodity prices, and the nature of the industry have changed. Thus, an update of the previous information is warranted.

1.1 Purpose and Objectives

The purpose of this project is to provide an update of the previous study of industry economic impact. The objectives are:

- To provide a refresh of data that reflect industry development and changes in prices
- To estimate the economic impact of Ontario pedigreed seed production

1.2 Organization of the Report

Section 2 below develops an estimate of the value of direct output of the certified seed industry in Ontario. Section 3 estimates the economic impact of certified seed production in Ontario. Section 4 concludes the report.

2.0 Overview of the Ontario Seed Industry

2.1 Acreage, Production and Prices

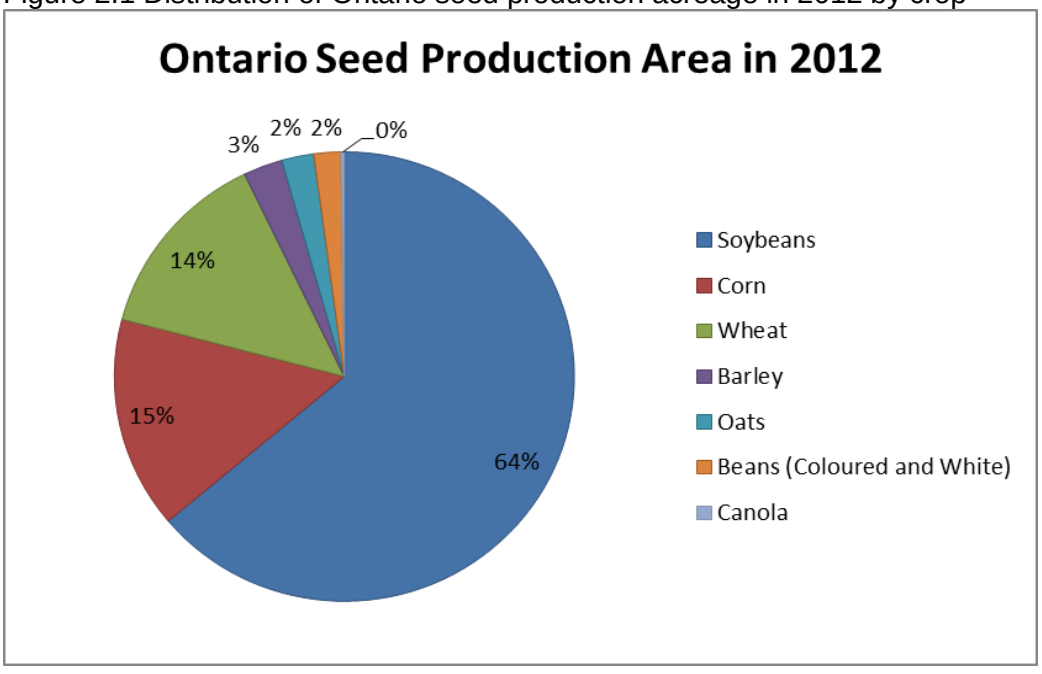
The overall area of agricultural land under seed production in Ontario was about 195,000 acres in 2012 (Table 2.1) with the largest proportion of the acres (64%) allotted to soybean seed production, followed by corn (15%) and wheat (14%) (Figure 2.1). This is a similar trend as reported in a previous study[1]

Table 2.1 Ontario Inspected Seed Acres, 2012

Crops	*Acres*
Soybeans	124,069
Corn	29,562
Wheat	26,714
Barley	5,369
Oats	4,373
Beans (Coloured and White)	3,684
Canola	456
Minor crops	546
Total	**194,773**

Source: OSGA

Figure 2.1 Distribution of Ontario seed production acreage in 2012 by crop



[1] Grier,K. 2002. Ontario Pedigreed Seed Industry Economic Impact Study. George Morris Centre.

The overall production of seed (in tonnes) was estimated using a 5-year average of crop yields reported by OMAFRA (2007-2011) and 2012 seed acreage reported by the OSGA. With the exception of corn, average crop yields are reasonable estimates of seed (pedigreed) yields for all crops. Based on a discussion with Ontario Seed Corn Growers as well as Agricorp, a seed corn yield of 65 bu/acre (1.65 tonne/ha) was used as an estimate of average yield of seed corn. This is an unconventional way of reporting seed corn yield; however it was necessary to have it expressed in this way to be comparable with other crops in obtaining overall economic impact. The resulting estimates of seed production in Ontario are shown in Table 2.2.

Table 2.2 Estimate of Ontario seed production in 2012

Crops	*Production (tonnes)*
Soybeans	139,581
Corn	19,740
Wheat	53,297
Barley	7,300
Oats	4,601
Beans (Coloured and White)	3,176
Canola	402
Minor crops	n/a
Total	**228,097**

Source: OSGA and OMAFRA

In order to estimate the revenue generated by the seed industry of Ontario, estimates of prices for each crop (seed) are required. To do so, seed costs were obtained from OMAFRA 2013 Crop Budgets[2] for each crop in question, and associated with the strandard seeding rate for each (Table 2.3). By dividing the budgeted seed cost per acre by the seeding rate, the implied unit cost of seed was obtained; this provides the basis to estimate seed prices. This is presented in Table 2.4 below, with price estimates adjusted to tonnes.

Table 2.3 Seeding rates and costs per acre used to calculate average seed prices

Crops	*Seeding rate (lb/ac)*	*Cost of certified seed ($/acre)*
Soybeans (RR and Conventional)	56	72
Corn (RR)	27	111
Wheat (winter and spring)	139	66
Barley	120	48
Oats	85	36
Beans (Coloured and White)	70	100
Canola (Spring, hybrid seed)	5	62

Source: OMAFRA 2013 Field Crop Budgets

[2] http://www.omafra.gov.on.ca/english/busdev/facts/pub60.pdf

Table 2.4 Average Estimated certified seed prices in 2012

Crops	Average Price ($/tonne)
Soybeans	2,812
Corn	9,141
Wheat	1,041
Barley	882
Oats	922
Beans (Coloured and White)	3,139
Canola	27,271

Grier (2002) assumed that about 65% of all seed production qualifies and certified seed. Based on feedback from the OSGA, under current conditions this is now believed to be about 70% of production from inspected acreage. Thus, it was assumed that 70% of certified seed production is marketed as seed. Based on this information the aggregate value of certified seed for the above crops can be estimated.

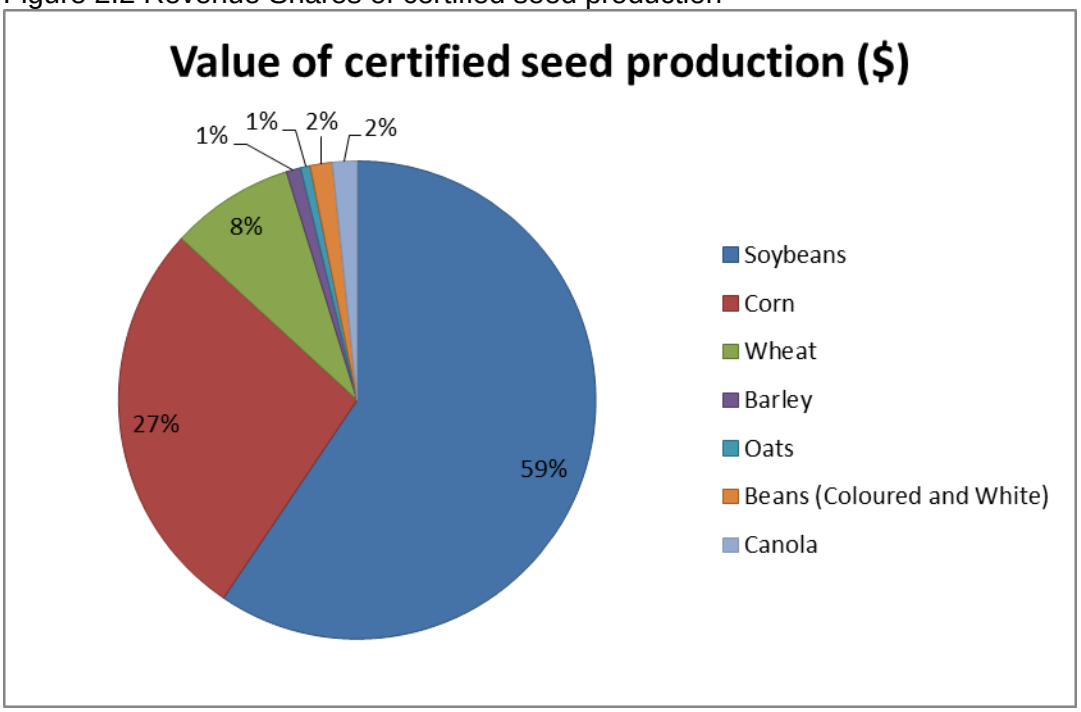
2.2 Certified Seed Revenue

The aggregate revenue associated with certified seed in Ontario was estimated by adding revenues of each individual crop seed value. The value of certified seed for each crop was calculated as a product of seed acres, yield per acre, average price and the assumed proportion of production from inspected acreage sold as certified seed. The revenue values and shares are shown in Table 2.5 and Figure 2.2.

Table 2.5 Estimated certified seed revenues in 2012

Crops	Revenue ($)
Soybeans	274,747,436
Corn	126,301,922
Wheat	38,832,111
Barley	4,506,541
Oats	2,969,779
Beans (Coloured and White)	6,978,114
Canola	7,679,655
Total	**462,015,557**

Figure 2.2 Revenue Shares of certified seed production



To validate the estimate of certified seed sales for these crops, an alternative approach was tested using total seeded acreage of the above crops, budgeted seed cost, and expected share of certified seed in reported seed costs. This is presented as "Method 2" in the appendix. This approach assumes that, for these crops, Ontario is essentially self-sufficient seed production, and that the assumptions of certified seed shares of overall seed use are representative. As shown in the Appendix, the two approaches provide an estimate of aggregate sales that this virtually equivalent. Thus, this second method essentially validates the approach used above.

3.0 Economic Impact

To estimate the economic impact of the sales estimated above, the Statistics Canada Industry Accounts Division / System of National Accounts Input-Output Tables multipliers were applied. These input-output multipliers estimate the effects on the economy of an exogenous change in final demand for the output of a given industry. As such, they provide a measure of the interdependence between an industry and the rest of the economy.

The multipliers estimate the direct, indirect, and induced effects on gross output, the detailed components of GDP, jobs, and on imports. The direct effects are the sales themselves (as reported above). The indirect impacts measure the impact of certified seed production through purchases of inputs on supplying industries; induced effects relate to the secondary effects on the supplying industries of purchases and inputs originating. For example, an indirect impact of the certified seed industry might be increased fertilizer sales; the induced benefit might be increased sales of groceries, haircuts, and automobiles from employees in the fertilizer industry ultimately attributable to certified seed.

The sales values estimated in Section 2 above implicitly combines multiple market levels. There is the production on the farm of the certified seed, seed cleaning and conditioning, and wholesaling/sales to the farmer/end user. The input-output multipliers are additive, so multipliers applied at a given point in the marketing chain reflect market levels up to that point.

With this understanding, plausible multipliers to associate with certified seed are “wholesaling” or “Support Activities for Crop Production”. Given that these multipliers capture the impact of economic activities up to the point for which they are defined, there are advantages to using Support Activities for Crop Production. It is specific to crop production, and to some extent, it will reflect the upstream economic activity of crop production in production of certified seed (along with fertilizers, agricultural chemicals, etc.). In contrast, wholesaling is not specific to agriculture or crop production and the upstream economic activities are not as easily defined. Thus, the multiplier for Support Activities for Crop Production was associated with certified seed sales estimated in Section 2.

Table 3.1 below presents the estimated annual economic impact results. As estimated above, the direct sales (impact) from certified seed in Ontario is about $462 million. The table shows that when this is combined with the indirect and induced benefits, the estimated value of gross output attributable to certified seed is almost $985 million; this contributes an estimated $648 million to GDP. Full-time equivalent employment generated is estimated at 14,812, valued at just over $430 million in wages and salaries. Taxes generated are an estimated $21.1 million.

Table 3.1 Economic Impact Results

	Multiplier Support Activities for Crop Production (2008)	*Result*
Direct Impact (Sales)	-	$462,015,557
Gross Output	2.13198	$985,008,039
Gross Domestic Product	1.40260	$648,024,349
Jobs	32.06*	14,812
Wages and Salaries	0.9336	$431,337,724
Taxes	0.04573	$21,127,906

* per $ million direct impact

4.0 Observations and Conclusions

The purpose of this study was to provide an estimate of economic impact associated with certified seed production in Ontario. To do so, certified seed acreage data was obtained, and based on seed yields and estimated seed values, the overall sales or direct economic impact was estimated. This was then associated with the appropriate Statistics Canada economic input-output multipliers to arrive at an estimate of economic impact.

The results suggested that the total direct impact of certified seed in Ontario is approximately $462 million; this result was validated using a secondary approach. When the Statistics Canada multipliers are applied, the total economic impact of the certified seed industry in Ontario is estimated at more than double this at about $985 million, with this economy-wide activity resulting in employment of almost 15,000 persons.

These results are different than the previous study conducted for the OSGA (Grier, 2002). Grier estimated the annual direct economic impact of pedigreed seed for a similar group of crops at about $60 million, and the sales of certified seed to growers at about $170 million. In completing the previous study, Grier conducted a survey of growers to obtain the farm gate value of pedigreed seed sales to obtain his estimate of $60 million; in this study, a similar survey was outside of the scope so the farm gate value could not be captured and instead the total value of certified seed was estimated. The Grier (2002) study estimated the value of certified seed purchases by growers at $170 million, which is much lower than the $462 estimated here. However, commodity grain prices in recent years are much higher compared with the early 2000's which are a key driver in certified seed pricing, and seed corn was not included in the 2002 study. Thus, the difference in results between the two studies can be reconciled.

To put these results in context, production, cleaning/conditioning, processing, and packaging of certified seeds by nature occurs in rural areas and small communities in Ontario. As such, the economic activity and employment created are especially important, because rural areas lack the economic diversity and depth that might exist in a larger urban location. Thus, the economic impact associated with certified seeds is very significant in providing economic opportunity in rural regions of Ontario which by nature lack the alternatives of larger centers.

Appendix- Validation Using Alternative Approaches

Method 2