THE MARKET FOR ORGANIC & ECOLOGICAL SEED IN CANADA

TRENDS AND OPPORTUNITIES, 2014

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IN PARTNERSHIP WITH

EXECUTIVE SUMMARY

by Matthew Holmes

Responding to unprecedented consumer demand, the organic market in Canada is growing rapidly. It tripled between 2006 and 2012, and is now valued at $3.5 billion per year. Producers are responding to this opportunity: from 2001 to 2011, the Census of Agriculture showed a 66% growth in organic farms. This said, demand continues to outstrip domestic supply, and 49% of the Canadian organic market is served by imported goods (COTA, 2013).

In 2011, 3,713 certified organic farms accounted for roughly 1.8% of all farms in Canada. The figure rises to about 2% when we include farms transitioning to organic. From 2001 to 2011, the Census of Agriculture showed a 17% decrease in the overall number of Canadian farms, but a 66.5% increase in the number of organic operations. Within this overall growth trend there has been fluctuation. The number of primary organic producers declined following the 2008 recession, particularly in the Prairie region. It remained relatively flat until a surge of new producers came on board in the spring of 2014. Over this same period, growing consumer interest in local food, direct-to-farmer engagement and heritage varieties has also fostered a strong base of low-input, non-chemical "ecological" agriculture. Canada's total area in certified organic production, including annual and perennial crops, forages, and pasture, is estimated at 1.67 million acres. With the addition of growers who identify as producing ecologically without pursuing organic certification, the total area is estimated at 4.5 million acres.

Recent studies have brought to light these trends in the organic sector; however, relatively little is known about its foundation: organic seed. For the first time, this study uses acreage data for organic vegetables and field crops to estimate the area under ecological production. This provides a benchmark of the value of the organic and ecological seed market in Canada, its potential for growth, and key recommendations to develop this sector. The study focuses on vegetables and field crops, and only briefly considers forage, cover crop, herb, mushroom, or greenhouse production.

ORGANIC VEGETABLES AND VEGETABLE SEED

There are at least 8,357 acres of certified organic vegetables in production in Canada. Roughly twice this number (17,550) is managed ecologically, for a combined total of 25,907 acres nationwide. In 2012, vegetables represented less

than 1% of the organic acreage in Canada (0.52%). However, these crops are high-value and roughly 40% of organic market sales are in the "fresh" category. In this category, we estimate that Canadian vegetables capture 26% of domestic sales. Potatoes (4,700 acres), green beans (1,435 acres) and sweet corn (1,400 acres)[1] are the vegetable crops with the largest acreage under organic and ecological production.

Organic growers purchase $9 million in vegetable seeds per year, and ecological growers $19 million, for a total estimated market of $28 million annually. Quebec and British Columbia have the highest seed market value, together accounting for almost 60% of the national total. Ontario has the largest vegetable acreage among all provinces but ranks third in seed market value. This discrepancy between acreage and market share can be largely attributed to the fact that Ontario produces less of the highest value crops (potato and garlic) than Quebec and British Columbia.

ORGANIC FIELD CROPS AND FIELD CROP SEED

In 2012, field crops made up 38.5% of the total organic acreage in Canada, with 720,000 acres in production. We estimate an additional 1.15 million acres grown using ecological methods[2], for a total of 1,870,000 acres. The vast majority of this acreage is located on the Prairies: 78% of the national total. Wheat is the most important organic field crop, representing more than a quarter of production (203,000 acres), followed by oats (127,000 acres), and barley (82,000 acres). The detailed breakdown of organic field crop acreage is provided in Appendix 2.

Unlike vegetable producers, organic and ecological field crop growers tend to use a great deal of saved seed, upwards of 60% by some estimates, though it varies tremendously from one crop to another. The market for organic and ecological seeds is estimated at $20.06 million annually (with an additional $30.09 million in saved seed planted). Saskatchewan accounts for half of Canada's organic and ecological field crop seed market, at $10.16 million. Many organic growers purchase conventional, untreated seed. If organic field crop growers were to maintain their seed-saving practices, but purchase exclusively organic seed, the value of the market for organic seed would increase by a minimum of 300%.

UNDERSTANDING TRENDS AFFECTING THE CHOICE TO SOURCE NON-ORGANIC

For the first time, through this research, organic certifiers were surveyed on their experience with seed. Survey results provided insights on the use of pedigreed organic seed, trends in procurement and, in particular, the use of derogations by organic farmers to purchase non-organic, untreated seed.

Potatoes were identified by 43% of respondents as the most common derogation request for vegetable crops in Canada. For field crops, the three derogations most commonly cited were corn, soybean and wheat. Organic farmers most often cite the need for specific varieties in their request for seed derogation. Other factors such as quantity, germination rates and cost are also mentioned as inhibiting factors. A vast majority of organic inspectors reported that the demand for derogation remained steady or increased over the past two years, particularly for field crop seed.

CHALLENGES

Two main factors constrained data collection for this research: reliance on voluntary disclosure of information by organic certifiers, and limited sources of data. Without a mandatory and coordinated national data collection system, accurate and consistent data collection and analysis for the organic seed sector is seriously impeded.

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1 Sweet corn is included in this study under the vegetable category. Corn used as livestock feed and for other food products is included under the field crop category.

2 For a description of ecological methods, please refer to definitions section.

KEY RECOMMENDATIONS

The organic market is dynamic and evolving rapidly, and there is significant growth potential for organic seed, both at production and in the marketplace. To this end, the study makes the following recommendations to organic seed proponents:

Increase investment in organic seed research and development to increase availability of varieties that respond to the needs of organic producers.

Support the scaling-up of organic seed production to provide quality seed in the varieties and quantities producers need. Beginning with expansion of a selection of high-potential crops will build capacity and readiness for future growth.

Foster vertically integrated relationships. This will aid in understanding local market needs and opportunities, but also carry through the value chain - having the right seeds for producers to grow the crops buyers need to meet the preferences of end-consumers (be it for direct sale, processing or retail).

Develop a national communications and marketing strategy and identify key partners, stakeholder groups and opportunities for integration and collaboration with the broader organic sector (e.g. for research and data collection, capacity development, regulatory issues, and marketing).

Develop a coordinated approach among certifying bodies with regards to data collection and approaches to seed derogations.

Use data from certifying bodies to help quantify the economic contribution (current and potential) of local organic seed, as a means to help build a case for support to producers and purchasers to invest in the sector over the long term.

Foster relationships with relevant government officials, industry representatives and groups such as the Canadian Seed Growers Association to relay information and integrate the realities of the organic market within the broader seed sector.

Ensure actions to support the development of the organic seed market (such as a consistent approach to derogations) take place in a manner that allows growers access to a wide diversity of varieties and that values the role of seed saving in the organic community.

Support the development of the organic sector in Canada as a whole, as a means to grow the market for organic seed.

TABLE OF CONTENTS

INDEX OF FIGURES

INDEX OF TABLES

ACKNOWLEDGEMENTS

This study was initiated by The Bauta Family Initiative on Canadian Seed Security. The program works with producers and partners to build a diverse and resilient Canadian seed system by pursuing the following objectives:

To increase the quality, quantity and diversity of ecologically grown Canadian seed

To promote public access to seed

To facilitate collaboration among individuals and organizations committed to advancing an ecological and diverse seed system in Canada

To respect, advance, and promote the knowledge of farmers in seed and food production

For a program committed to advancing organic and ecological seed production in Canada, the dearth of information available on the market for this seed is a significant challenge. The goals of this study were to uncover the current and potential market for ecological and organic seed, provide crop- and region-specific information for producers and other stakeholders interested in expanding this market, and set a precedent for ongoing data collection in the sector.

This study has achieved these goals, and The Bauta Family Initiative on Canadian Seed Security wishes to thank the Canadian Organic Trade Association, in particular Matthew Holmes and Marie-Eve Levert, for their leadership and dedication.

Also to be thanked are the volunteers who reviewed this study: Dag Falck, Karl Fiander, Lisa Mumm, Patrick Steiner, and Laura Telford.

The Bauta Family Initiative on Canadian Seed Security is made possible thanks to the vision and leadership of Gretchen Bauta, member of the Weston family. It is delivered by USC Canada, in partnership with Seeds of Diversity Canada and through the generous support of The W. Garfield Weston Foundation.

INTRODUCTION

In 2013, USC Canada, through their Canadian field program The Bauta Family Initiative on Canadian Seed Security (BFICSS), mandated the Canada Organic Trade Association (COTA) to assess the market for organic vegetable and field crop seed market in Canada. The objectives of this study include:

1. Highlighting current organic and ecological vegetable and field crop seed markets;

2. Assessing potential markets for organic and ecological vegetable and field crop seed;

3. Understanding operator-level requests for derogations[3] for organic seeds by certified organic seed growers;

4. Making recommendations to overcome obstacles that inhibit growth of the market for organic and ecological seed in Canada; and

5. Providing recommendations to internalize ongoing data collection in the organic sector, so as to provide an opportunity for performance benchmarking and longitudinal insights.

COTA established its analysis based on three sets of data. First, in collaboration with Anne Macey at the Canadian Organic Growers, COTA carried out the most comprehensive compilation of organic acreage information since Canada's Organic Products Regulations were implemented in 2009, gathering information by province and by crop type. Knowledge of the number of acres under organic production by crop provided a benchmark to establish the demand for seeds. Second, ecological acreage compared to organic acreage was estimated based on 2006 and the 2011 Agricultural census information, and applied to the known 2012 organic acreage to give an overall estimate of both acreage types in Canada. Finally, market value was estimated based on average compilation of seeding rates and cost per acres by crop.

To assess demand for organic seed derogations, COTA surveyed organic inspectors who, given their integral role in the organic certification system, have a broad perspective on seed procurement trends in Canada. The survey aimed to: identify the most common derogations for vegetable and field crop seed; determine if the demand for derogation has been increasing, maintained or decreasing; and identify general issues and trends regarding seed derogation in Canada.

Recommendations on long-term capacity building and solutions to overcome barriers to the development of the sector are listed in the last section of the report. They are based on a combination of interviews with researchers, seed producers and seed retailers as well as a literature review and field observations.

3 Derogation: Under the Canada's Organic Products Regulations (OPR) and Organic Standards, farmers are only allowed to use organic seeds, but exceptions are permitted. Conditions to obtain a derogation are described in Chapter 1.

Finally, it should be noted that COTA's initial environmental scan brought to light a severe shortage of data on organic and ecological seed in Canada. The scarcity of information constrained this study and its results. Those limitations and their effects are treated in the last chapter of this report as well as the recommendations section.

DEFINITIONS

Organic	**Organic farming refers to farms that are certified organic by a certification body (CB) accredited under the Canadian Organic Regime.**
Ecological	**This study uses the following definition, provided by Ecological Farmers of Ontario (2012): Ecological farming refers to farms that employ principles that "maintain and enhance the health of the soil, water, crop, livestock and the diversity of the environment". Ecological is a voluntary designation that does not involve any third party certification. This means ecological farmers may use substances prohibited by organic standards, including treated seed. This study provides estimates for total seed purchasing among ecological growers, however more research is needed to understand the details of their procurement practices.**
Organic seed	**Organic seed refers to seed that is certified organic by a Certification Body (CB).**
Conventional seed	**For the purpose of this study, conventional seed refers to a non-GMO variety that is not certified organic. This category can include treated seed.**
Untreated conventional	**For the purpose of this study, untreated conventional seed refers to seed that conforms to the definition of conventional seed above, but excludes treated seed. Organic growers may use this type of seed if they obtain a derogation from their Certification Bodies (CBs).**
Field Crops	**For the purpose of this study, the field crops category includes cereal crops (e.g. barley, wheat), oilseed crops (e.g. mustard, soybean), and pulses (e.g. lentil), but exclude forage crops.**
Vegetables	**For the purpose of this study, the vegetables category includes vegetable and garden crops (vegetables grown for edible leaves, shoots, flowers fruits and seeds) as well as root and tuber crops (vegetable crops grown for their underground parts). Vegetables, roots and tubers cultivated for human consumption belong to this group. Vegetables grown principally for animal feed are excluded. This section also includes vegetables cultivated for seed.**

CHAPTER 1 BACKGROUND INFORMATION

1.1 OVERVIEW OF THE CANADIAN ORGANIC MARKET

The value of the Canadian organic food and beverage market, at $3.5 billion per year, has tripled since 2006 (COTA, 2013). This far outpaces the growth rate of other agri-food sectors. More than 20 million Canadians (58% of the population) buy organic food weekly, and the majority of these buyers plan to increase or maintain their spending. Canadian products capture 51% of organic food and beverage sales (excluding alcohol) (COTA, 2013), and their total value is $1.45 billion each year.

Fruit and vegetables are the leaders in organic sales, capturing over 40% of the total. This figure will likely grow, seeing as 98% of organic shoppers expect to increase or maintain spending on organic fruits and vegetables over the next year. COTA estimates that Canadian fruit captures 15% of domestic sales, and Canadian vegetables, 26%. Direct-to-consumer sales (farmers markets and community supported agriculture) are a growing segment of the market in all provinces, valued at over $316 million in 2012.

1.2 CANADIAN ORGANIC ACREAGE

Total acreage in certified production of field crops, vegetables, fruit and nuts and perennial crops, forages and pasture is estimated at 1.67 million acres.

Table 1 - Organic acres by crop and province (2012)

Province	Vegetable	Field crop	Fruit and nuts	Pasture, Forages, Green Manures, Natural Areas	Total
BC	2,337.26	10,073.77	2,416.09	54,273.85	69,100.98
AB*	383.34	73,857.89	85.05	282,634.10	356,960.38
SK	517.04	452,959.32	512.55	347,381.37	801,370.27
MB*	110.72	37,360.38	27.19	16,742.35	54,240.64
ON	2,794.40	83,905.98	1,069.05	51,357.21	139,126.63
QC	1,730.18	57,495.92	8,755.60	165,512.39	233,494.09
NB*	35.80	145.23	26.89	8,290.27	8,498.18
NS*	6.07	287.49	0.24	389.62	683.42
PEI*	714.43	4,662.92	66.45	1,406.07	6,849.86
YK	23.58	8.50	127.28	108.50	267.86
Total	8,652.81	720,757.39	13,086.38	928,095.72	1,670,592.30

* Missing data

Source: Macey and Holmes, 2014

Pasture, Forage crops, Green Manures and Natural Areas account for 55% of the certified production area, followed by field crops (43%), fruits and nuts (0.78%) and vegetables (0.58%)[4].

4 Despite the low acreage, the higher price per acre of vegetables makes them an important organic crop in the country. Also the requirements for organic vegetable farming do not require large amounts of land.

1.3 NUMBER OF PRODUCERS AND OPERATORS

In 2011, 3,713 certified organic farms accounted for about 1.8% of all farms in Canada. Add transitional farms, and together these farms represent roughly 2% of agriculture nationwide.

The number of primary producers[5] declined slightly (2.8%) in 2012. This is largely due to steady attrition in certified organic producers since the economic recession in 2008, particularly in Saskatchewan and Manitoba. For the first time, the number of producers in Quebec (1,039) now surpasses the number in Saskatchewan. British Columbia's organic sector is steadily growing, with a 7.3% increase in 2012. In the same year, the number of certified producers remained stable in the Atlantic Provinces and Ontario.

A total of 1,237 operators manufactured, handled, or distributed organic products across Canada in 2012 (this includes everything from certified seed cleaners to food manufacturers). This is 24% higher than reported in 2011. Quebec accounts for 48% of the total for processors, handlers and distributors (578), followed by Ontario (282), and British Columbia (213).

1.4 CANADIAN SEED POLICY

Canada's seed system is highly regulated, and the policies governing seed have strong impacts on research and development, production, distribution, and sale. In 2013, The Bauta Family Initiative on Canadian Seed Security reviewed four key frameworks governing vegetable and field crop seed (the Seeds Act; Organic Products Regulations; intellectual property regulations; and, the International Treaty on Plant Genetic Resources for Food and Agriculture), and prepared an analysis of their impacts on biodiversity, ecological production, and public access to seed.

In general, the analysis revealed that the regulations governing seed in Canada are not favourable to the development of the organic seed market. A regulatory tendency oriented towards large-scale conventional production and proprietary research and development meets the needs of some producers and markets. However, there are troubling impacts on the development of sectors such as organics. Variety registration and pedigreed seed certification systems have a significant influence on the varieties of field crops available in the marketplace. These systems are tailored to conventional seed production, and present significant barriers to the development and circulation of varieties that would be well-suited to organic farming systems. As the organic sector grows, it would be beneficial for members of the sector to engage with policymaking and oversight bodies (such as the Canadian Seed Growers Association) to explore options to better accommodate the organic sector. For example, allowing for organic trials of new varieties during the variety registration process would provide information that would greatly benefit organic producers.

Canada's national organic standards, under the authority of the Organic Products Regulations, require the use of organic seed in organic production. However, it is possible to obtain a derogation if a producer can show unsuccessful attempts at procuring organic seed from three sources. This option is exercised often, and many organic producers use conventional untreated seed in their production.

These and other dynamics are explored in the full analysis, available on the program's website at www.seedsecurity.ca.

5 Primary producers include those with the following types of enterprises: crops of all kinds including mushrooms, livestock operations, bees and wild harvests.

CHAPTER 2 METHODOLOGY

The report aims to provide an assessment of the market for organic and ecological vegetable and field crop seed in Canada. Each market has its own characteristics and specificities, and is treated separately.

2.1 DATA SOURCES AND DATA COLLECTION

Figures for 2012 organic acreage and number of producers for each province were obtained through the six largest Certification Bodies (CBs) in Canada; each providing data on acreage by per crop type and per province. This information was complemented by data from the 2011 Census of Agriculture, provincial statistics (where collected) on acreage by crop, and Anne Macey's report (2013) on organic acreage in British Columbia.

2.2 ESTIMATING ECOLOGICAL ACRES FOR VEGETABLE AND FIELD CROPS

No data exist on the number or acreage of "ecological" farms in Canada, as the term itself is dynamic and a voluntary descriptor. However, the 2006 agricultural census provides the numbers of certified organic farms, those transitioning to organic, and those claiming to use some form of organic methods (though not certified). This study uses the number of self-declared uncertified organic farms from the 2006 census to approximate the number of "ecological" farms in Canada.

Since no data exist on ecological acreage, we assume that the ratio of the number of uncertified organic farms to the number of certified and transitional farmers to be equal to ratio of the acreage of uncertified to certified and transitional farms each year. This assumption expressed as an equation looks like this:

$$\frac{\#\ of\ uncertified\ farms}{\#\ of\ certified+transitional\ farms} = \frac{acreage\ of\ uncertified\ farms}{acreage\ of\ certified+transitional\ farms}$$

For example, according to the 2006 agricultural census, there were 2.8 times more uncertified organic farms than certified and transitional farms in Canada. We then estimate that there were 2.8 times more ecological acres than certified and transition acres in the same year.

Due to the implementation of Canada's Organic Products Regulations in 2009, the 2011 agricultural census only compiled information on the number of certified and transitional farms. Farms using organic methods without being certified were not included. To complete the picture for the most recent year of agricultural census data, we applied the above ratio to the 2011 census information and carried out the calculations shown in Table 2.

The first step is to evaluate the numbers of certified, transitional, and uncertified organic farms in 2011. To do this, we apply the percentage decrease in the number of all farms in Canada from 2006 to 2011 (-10.3%)[6] [7] to the

6 In 2011, Canada had 205,730 census farms, a decrease of 10.3% (23,643 farms) since the last census. We make the conservative assumption that the rate of decrease in the total number of farms can be applied to the sum of organic and uncertified organic farms. Since the Agricultural census (2011) provides the number of certified and transitional farms, when we apply the decreasing rate on the sum of certified and uncertified organic farms, this decreasing rate of 10.3% only affects the estimated numbers of uncertified farms.

7 The decrease of the number of the field crop farms has been adjusted to 15.3%, which represents the average decrease of the overall number of farms in the Prairies (Alberta, Saskatchewan and Manitoba) from 2006 to 2011.

number of organic farms (certified + transitional + uncertified). Seeing as the Census of Agriculture showed that organic farms are not declining, this provides us with a conservative estimate of the total number of certified organic and transitional farms in 2011. We then subtract the number of certified + transitional organic farms from this total to establish the number of uncertified organic farms.

The table below provides data from the 2006 and 2011 agricultural census. The three rows of data provided for each year show the total number of farms, followed by the fruit, vegetable and greenhouse farms, and the hay and field crop farms. Livestock and other crop groups were omitted, which explains the gap between the total number of farms and the sum of the other two rows.

Table 2- Estimate of the number of farms selling ecological products (2011)

	Certified & transitional organic farms	Uncertified organic farms		Total organic & ecological farms	
2006					
Canadian organic farms (Total)	4,195	11,937		16,132	
Fruit, vegetable and greenhouse farms	1,041	2,754		3,795	
Hay and field crop farms	2,913	5,126		8,039	
2011 (est.)			change since 2006		% change since 2006
Canadian organic farms (Total)	3,713	10,757	-3,713	14,470	-10.3%
Fruit, vegetable and greenhouse farms	1,095	2,309	-1,095	3,404	-10.3%
Hay and field crop farms	2,608	4,201	-2,608	6,809	-15.3%

Finally, we calculate the farm ratio to estimate the acreage of ecological farms in 2011. The overall ratio for all organic farms in Canada is 2.9%; for fruit and vegetable farms it is 2.1%; and for hay and field crop farms it is 1.6%. These ratios are applied to the 2012 (Macey & Holmes, 2014) organic acreage data to estimate the number of ecological acres; the author considers this a conservative baseline estimate.

2.3 DESCRIPTION OF METHODOLOGY

Adding 2012 organic crop and acreage information from CBs and provincial governments to the estimated number of ecological acres provided a figure for the total area in organic and ecological production. We then estimated the quantity and value of organic and ecological seed that would be needed to meet the needs for each crop. This method allows us to estimate potential market for organic and ecological seeds, if all organic and ecological growers were to buy seeds for all their crops.

Seed saving practices were also taken into consideration. Many growers use both saved and purchased seed to sow their fields. This is particularly important for field crop producers and organic growers in general, whose agronomic needs are not necessarily taken into consideration by commercial developers. Of course, saving seed as opposed to purchasing each year provides cost savings as well. An organic seed market evaluation by Eco-Ressources (2011) provided the ratios of saved, conventional, organic, and pedigreed seeds for annual vegetable, field crops, forage crops and green manure markets. These ratios were used in this study to acknowledge the value of seed saving to farmers. Potential market growth is estimated based on a switch from conventional to organic seed purchasing, with seed saving practices remaining stable.

2.4 LIMITATIONS

Two main factors constrained data collection for the research: voluntary disclosure of information and limited sources of information. Canada's organic sector currently relies on voluntary disclosure of data by certifiers, provincial organizations and some governments for information on organic acreage. Voluntary participation of the CBs for this research was significant, making this data collection the most comprehensive and detailed since Canada's Organic Products Regulations were implemented in 2009. However, until there is a mandatory and coordinated national data collection system, this method will remain open to inconsistencies. Figures for organic acreage should be considered as conservative estimates.

When creating the methodology of this study, several options for data collection on the organic and ecological seed market were explored. Below is a list of avenues that were not successful.

Organic Pedigreed seed	**The Canadian Seed Grower Association (CSGA) has information the number of pedigreed seed growers, and inspected acres of pedigreed seeds by crop. However, they do not carry statistics on organic pedigreed seeds.**
Import/ Export	**Statistics Canada produces monthly reports on seed import and export by crop using HS Code (harmonized system code). However, there are currently no HS codes that specify or disaggregate organic seeds.**
Greenhouse vegetable growers	**Provincial greenhouse grower associations do not collect information from their members on greenhouse organic acres. This report was able to collect some acreage information on greenhouse vegetable organic acres from at least three Certification Bodies, but data for this sub-sector are incomplete.**

Additional data sources that could help assess the ecological and organic seed market in Canada include seed producers and retailers, and documented sales of organic pedigreed seed. The scope and timeframe for the study did not allow for exploration of these sources, and they should be considered in future research.

CHAPTER 3 CANADIAN VEGETABLE SEED MARKET

3.1 THE CANADIAN ORGANIC VEGETABLE SEED MARKET

Table 3 - Value of Organic and Ecological Vegetable Seed (2012)

Type of Seed	Estimated Market
Organic growers	
Conventional untreated	**$3.20 M**
Organic	**$5.94 M**
Ecological growers	
Total	**$19.19 M**

There are at least 8,300 acres of organic vegetables in Canada and roughly twice this number (over 17,550) in ecological acres, for a total of 27,382 acres nationwide. In 2012, organic vegetables represented 0.52% of the total organic acreage in Canada. Organic growers purchase $9.14 million in seeds per year, and ecological growers an additional $19.19 million, for a total estimated market value of $28.33 million annually[8].

According to Eco-Ressources (2011), organic vegetable growers purchase 35% conventional and 65% organic seed. Applying this ratio to our figures provides an estimate of $3.2 million in potential market growth if organic growers switch from conventional untreated to organic seed. Since no research exists on seed procurement among ecological growers, it is impossible to determine their ratio of conventional to organic seed purchasing. Total seed purchases for ecological growers amounts to $19.19 million annually[9]. The portion of these seeds that are conventional untreated is a potential market for organic seed producers. Virtually all vegetable seeds, conventional and organic, are imported. This means significant growth potential if local organic seed producers were able to serve the needs of local organic vegetable producers.

In this section we evaluate Canada's organic and ecological vegetable seed market. Certifying bodies collect data in different ways, and some do not collect crop-specific information. The 'generic vegetable' category cannot be disaggregated due to a lack of crop-specific data. The lack of consistency in data collection and lack of crop-specific data for the vegetable seed market are arguments for a consistent and coordinated approach to data collection for the sector.

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8 To estimate the value of the organic and ecological vegetable seed market, a seeding rate was established for each crop type. The seeding rate information from High Mowing, Veseys, Johnny's Seed, Seminova and West Coast Seeds were used for the estimation, depending on the crop. Only information from larger seed companies was used because small seed companies tend to not sell in bulk and serve primarily the home gardener clientele. The cost per acre was estimated based on average vegetable seed price (from the largest ecological and organic seed companies) and the seeding rate.

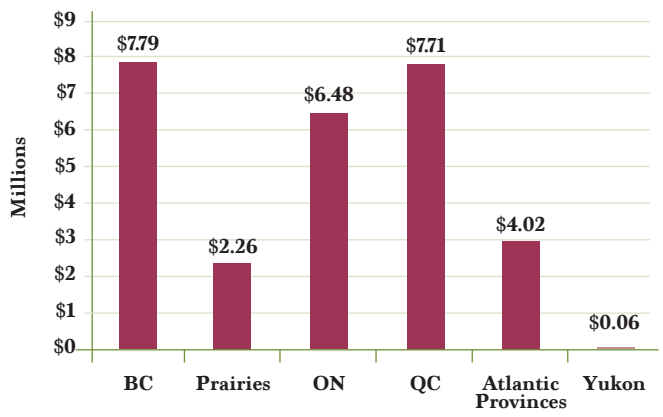
Cost per acre = seeding rate × average seed price

The market value was calculated from the number of acres and the estimated cost per acre:

Market Value = number of acres × cost per acre

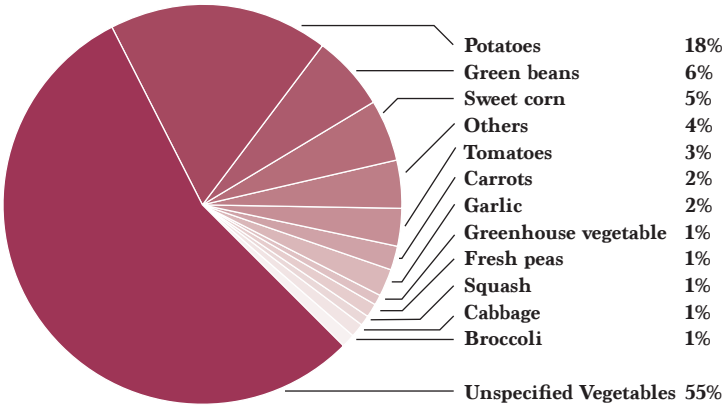
9 The percentage of locally grown seeds is not specified in the Eco-Ressources' research.

Figure 1 – Organic and ecological vegetable seed market by region (2012)



Our research determined that Quebec and British Columbia have the highest seed market value, together accounting for almost 60% of the total for Canada. Ontario has the largest acreage among all provinces but ranks third in market value. This is explained in part by lower acreage in Ontario of the most expensive seed crops (garlic and potatoes) compared with Quebec and British Columbia.

Figure 2 – Organic and ecological vegetable acres by crop type (2012)



Certifying Bodies do not systematically collect crop-specific acreage information for vegetables. Over half of the acreage (14,400) is listed under the generic "vegetable crop" category. For crops with known acreage, potatoes (4,700 acres), have the largest area under cultivation, followed by green beans (1,435 acres), and sweet corn (1,400 acres). A detailed list of acres by crop type is available in Appendix 1.

Figure 3 – Organic and ecological vegetable seed purchases by crop type (2012)

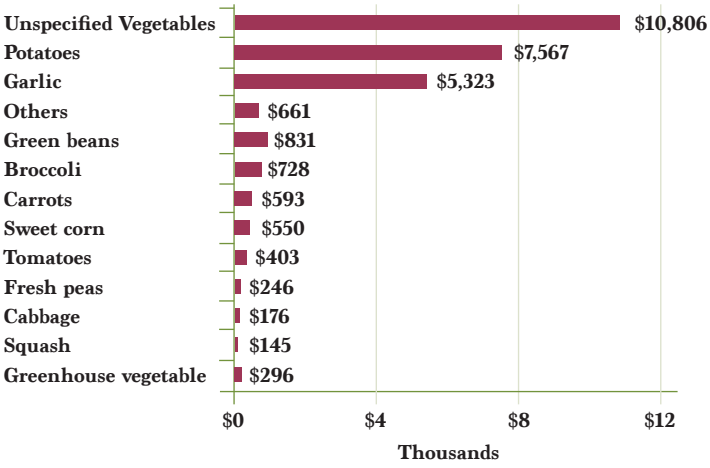


Figure 3 shows the breakdown of Canada's $28.33 million organic vegetable seed market. More than a third is under the generic category "vegetable". The assessment of the value of this category is based on an average cost of seed per acre, excluding garlic and potatoes[10]. Potatoes and Garlic have the highest cost per acre and account for a large part of the market value - 26% and 18% respectively[11]. There are high levels of seed saving for these crops. This value is excluded from the market evaluation, and the per-acre seed costs of potatoes and garlic were adjusted to reflect seed saving

10 Garlic and potatoes price per acre are high compared to all the other crops, and we therefore exclude it from the calculation of the average to avoid skewing the result.

11 Tubers/clones (planting stock) from these crops are saved frequently for replanting. They are never grown from true seeds.

practices[12]. The category "others" includes all remaining vegetable categories, such as lettuce ($22,455) and kale ($12,239). See Appendix 1 for full details.

Table 4 - Value of purchased and saved potato and garlic seed (2012)	
Crop	**Estimated Market Value**
Potato	
Purchased Seed	**$7.56 M**
Saved Seed	**$3.24 M**
Garlic	
Purchased Seed	**$5.23 M**
Saved Seed	**$5.23 M**

Table 4 illustrates the estimated value of purchased and saved seed for potatoes and garlic. It is estimated that 70% of the seeds sown on organic and ecological potato fields are purchased, and 30% are saved (clones/tuber). 50% of the seeds that grow the 394 acres of organic and ecological garlic are from saved seeds (bulbs).

BRITISH COLUMBIA

British Columbia has the second highest number of organic (2,305) and ecological (4,841) vegetable acres in Canada, behind Ontario. Potatoes (1,521), green beans (1,320), broccoli (156) and carrots (105) dominate the acreage in this province along with the "vegetable" category (3,690 acres). Vegetables represent 3.38% of organic agricultural land in BC With an estimated value of $7.79 million. British Columbia has the most important organic and ecological vegetable seed market in Canada.

Figure 4 – British Columbia organic and ecological vegetable seed purchases by crop type (2012)

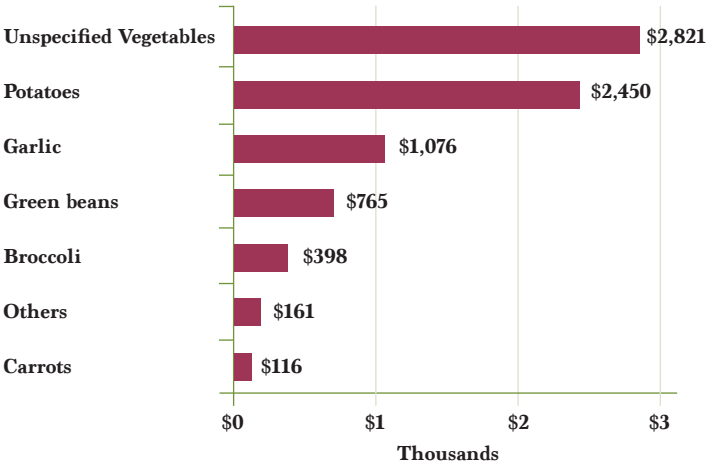


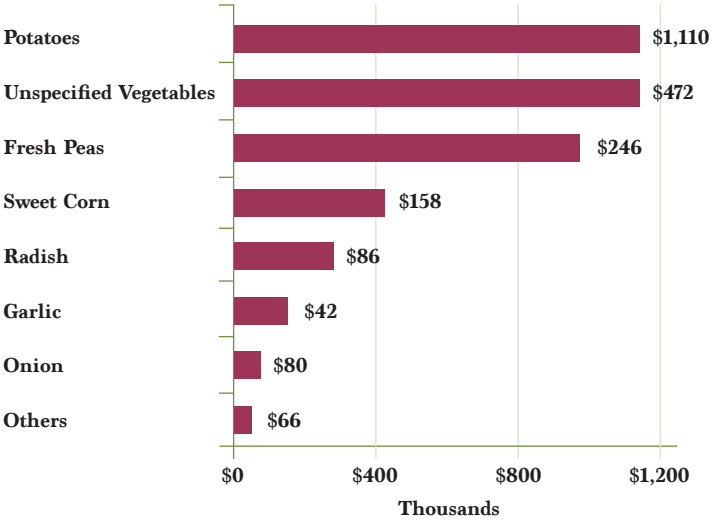
Figure 4 gives an overview of the market value by crop in BC. The category "Others" encompasses 13 crops. Onions ($45,000), squash ($36,000), cabbage ($20,000) and beets ($16,000) have the highest market value under the category "other".

12 To estimate the economic value of the saving practices of garlic and potato growers, small and large-scale growers were interviewed as well as organic agricultural experts. The economic value of seed saving practices was not included in the total value of the seed market.

PRAIRIES

Vegetables represent a small proportion of the organic acreage in the three Prairie Provinces: Alberta 0.1%, Saskatchewan 0.06% and Manitoba 0.2%.

Figure 5 – Prairie organic and ecological vegetable seed purchases by crop type (2012)

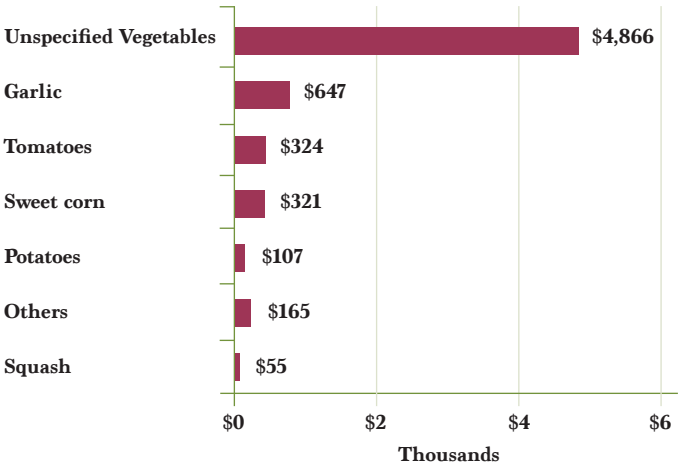


The Prairies have the lowest number of organic (728) and ecological (1,528) vegetable acres[13]. The seed market is estimated at $2.26 million, the second smallest in Canada. Potatoes dominate both in acreage (689 acres) and seed value ($1.1 million). Seventy percent of the market under the "others" category is from beans ($45,000).

ONTARIO

Vegetables make up 2% of the organic acreage in Ontario. Ontario has the highest number of organic (2,794) and ecological (5,868) acres in the country[14], but its organic and ecological seed market value ranks third. As previously explained, this is likely due to lower acreage in Ontario of the most expensive seed crops (garlic and potatoes) compared with Quebec and British Columbia.

Figure 6 – Ontario organic and ecological vegetable seed purchases by crop type (2012)



Ontario's organic and ecological seed market is estimated at $6.48 million. Figure 6 gives an overview of the market value by crop. The category "others" includes 9 crops. Carrots ($45,000), onions ($43,000) and cabbage ($24,000) make up 75% of the "others" category.

13 Vegetable acres estimate excludes herbs, rhubarb and mushroom acreage. Saskatchewan has 251.99 organic acres dedicated to herbs.

14 Vegetable acres estimate excludes herbs, sweet potato and mushroom acreage. Ontario has 125 organic acres dedicated to herbs.

QUEBEC

Quebec is the province with the most accurate acreage information by crop, thanks to the 2012 publication of organic statistics by the Conseil des appellations réservées et des termes valorisants. According to this report there are 1,745 organic vegetable acres in Quebec, representing 1.59% of organic agriculture in the province. Around 240 organic producers cultivate organic vegetables. Quebec has the second largest land area dedicated to organic (1,681 acres) and ecological (3,531 acres) agriculture in the country[15], and the second highest organic and ecological seed market, estimated at $7.71 million. At least 2.62 acres are dedicated to organic seed, and another 5.5 acres for ecological seed production.

Figure 7 – Quebec organic and ecological vegetable seed purchases by crop type (2012)

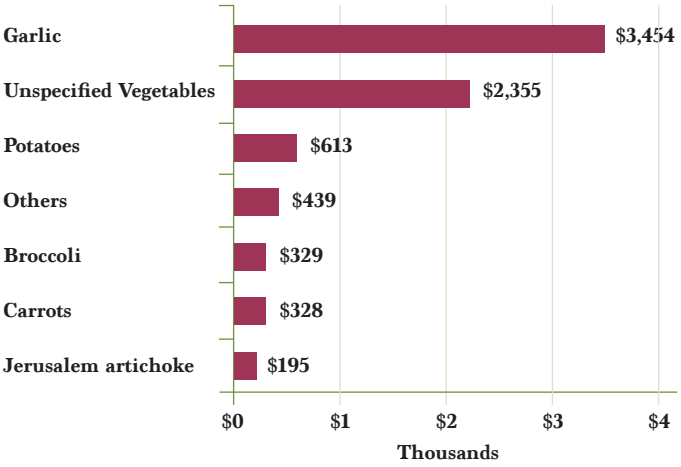


Figure 7 gives an overview of the market value by crop. The category "others" includes 13 different crops. Cabbage ($119, 000), sweet corn ($70,000), tomato ($51,000) and squash ($49,000) have the highest value under the category "others".

ATLANTIC PROVINCES

The Atlantic Provinces comprise 925 organic[16] and 1,942 ecological acres[17] of vegetables. The proportion of the total organic acreage allocated to vegetables varies by province: less than 1% for New Brunswick, 1.2% for Nova Scotia, but 12.8% for PEI. For this study, Atlantic Provinces do not include the provinces of Newfoundland and Labrador.

Figure 8 – Atlantic Provinces organic and ecological vegetable seed purchases by crop type (2012)

The organic and ecological seed market for the Atlantic Provinces is estimated at $4.02 million. Potato has the highest seed market value, and 98% is from PEI ($3.22 million). Turnips ($5,900), tomatoes ($4,700), onions ($3,700) and leeks ($3,100) comprise the majority of the market value in the "others" category.

15 Vegetable acres estimate excludes herbs, rhubarb and mushroom acreage.

16 For the CBs data in the Maritimes a large amount of farms acreage data were missing (NB missing acreage data for 35% of farms, NS for 72% of farms and PEI for 45% of farms). To complete the data, we increased the organic acreage by half of the % of the missing data under the vegetables crop category.

17 PEI 2,712.40 organic and ecological acres; NB 129.90 organic and ecological acres; and NS 25.61 organic and ecological acres.

YUKON

The Yukon has 73 acres of organic and ecological vegetables. The estimated value of the organic seed market is close to $ 55.9 K.

CHAPTER 4 CANADIAN FIELD CROP SEED MARKET

4.1 FIELD CROP SEED MARKET OVERVIEW

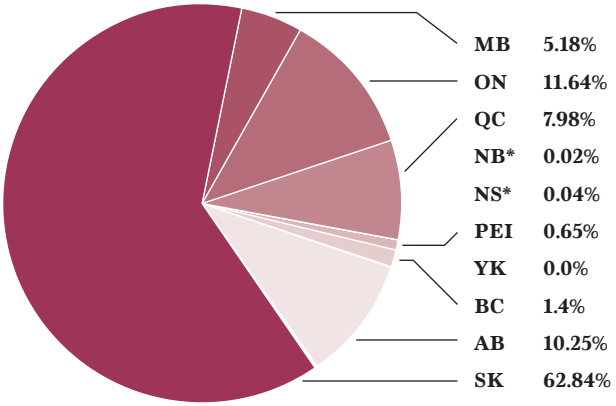
According to Manitoba Agriculture, Food & Rural Development (MAFRD) (2014), there was a significant price increase leading up to the recession in 2008 for organic Hard Red Spring Wheat and soybeans. This was followed by a price correction and prices of many organic field crops dropped in 2009. Since the end of the recession in 2011, prices again have been increasing rapidly. This kind of fluctuation affects all producers, both conventional and organic. Many grain growers stopped producing ecologically during and just following the recession, notably in Saskatchewan and Manitoba. This could explain the significant loss of organic acreage in the two provinces in the last four years. Notably, organic wheat acreage dropped by 50,000 acres from 2009 to 2012 (MAFRD, 2014).

Organic field crop producers in Canada are required to use certified organic seed, but very few seed suppliers carry organic seed. This is largely due to regulations governing production and sale of field crops in Canada. The Seed Act attempts to limit circulation of poor quality seed by preventing the sale of seed by variety name unless it is produced through the certified seed system. Certified growers use seed that is only a few generations from the breeder seed, and is considered "pedigreed". Seed growers are also inspected to ensure that their seed is indeed "true" to variety. While much of the field crop seed in Canada is exchanged outside of this system, there is increasing pressure on farmers to use only certified seed. This makes sourcing seed particularly difficult for organic producers, as there is pressure to use seed that is both certified (pedigreed) and organic, or "double certified". There is a premium for both certifications, making double certified seed very expensive. Farmers are reluctant to use it, so seed growers are reluctant to supply it.

Organic farmers must choose between certified seed or certified organic seed. The former requires an exemption from their certifying body, which as we will see later in this report, is not difficult to obtain. The latter can only be procured outside of the formal seed system, as it is not pedigreed seed. While there are a few suppliers of double certified seed in Canada, most only offer small quantities, and are located in Ontario and Quebec, far from the majority of Canada's large-scale organic field crop farms. In addition, pedigreed seed inspectors are not trained to accommodate the particularities of organic production, which could cause them to reject seed lots prematurely. There is also a lack of varieties that are adapted to organic production systems.

This being said, there is change afoot: a newly released organically-bred oat variety is being produced only on organic seed farms. Producers interested in growing this variety can only obtain it as organic seed. This push is coming from grain buyers, who have strong influence on the decisions of producers. If the trend continues, we may see growing presence of organic seed on the market in coming years.

Figure 9 – Organic and ecological field crop acres by province (2012)



In 2012, field crops made up 43% of the Canada's overall organic acreage, for a total of 720,000 acres. We estimate an additional 1,150,000 acres grown under ecological principles. This provides an estimated total of 1,870,000 acres of organic and ecological field crops[18]. It is important to note that self-identified ecological producers are not monitored. A grower may identify as ecological and grow using some agro-ecological principles, but still use treated seeds.

The Eco-Ressources (2011) research and interviews conducted for this study reveal that field crop seeds used by organic producers in Canada are mostly saved from the harvest of the crop the previous year. Seed saving is a common practice and because of the scarcity of organic seeds, it is particularly important in the organic sector. Since organics currently occupy a small portion of the seed market, research and development of new field crop varieties largely takes place without an eye to the organic sector's specific agronomic needs.

Based on a survey sent to 281 organic farmers, Eco-Ressources (2011) estimated that organic field crop growers were using 30% conventional seed (untreated), 60% organic saved seed and 10% organic pedigreed/organic seed. These ratios were applied to all crops, with the exception of hemp. Hemp is a controlled substance, and growers are forbidden to save seed (see section 5.2 for more detail), so all seed used for hemp production comes from pedigreed seed (for which there is only one organic supplier).

Applying the ratios above, the current market value of purchased seed is estimated at $1.93 million for organic pedigreed/organic seeds and $5.79 million for conventional untreated seeds annually. We estimate that ecological growers buy $12.34 million of conventional seeds annually to meet their needs[19] [20]. This provides a total value for all purchased organic and ecological field crop seeds of $20.06 million annually. The value of saved seed is estimated at $30.09 million.

18 See Chapter 2 for the methodology used to calculate the number of ecological acres.

19 Price lists are not as widely available for field crops as vegetable seed. Seed producers usually share their price list on demand. In order to estimate the value of the organic and ecological field crop seed market, we contacted several producers and asked the cost per acre for major field crops (organic and conventional). We also consulted online tools provided by provincial governments (Ontario and Manitoba) to calculate production costs. Seeding rates were calculated based on the average of conventional and organic seeding rates. Since many growers use conventional seeds (at least 30% according to Eco-resources (2011)), the estimated price per acre is an average of the price for organic and conventional seeds.

The market value was calculated from the number of acres and the estimated cost per acre:

The number of acres, cost per acre and market value estimate of each crop can be found in Appendix 2.

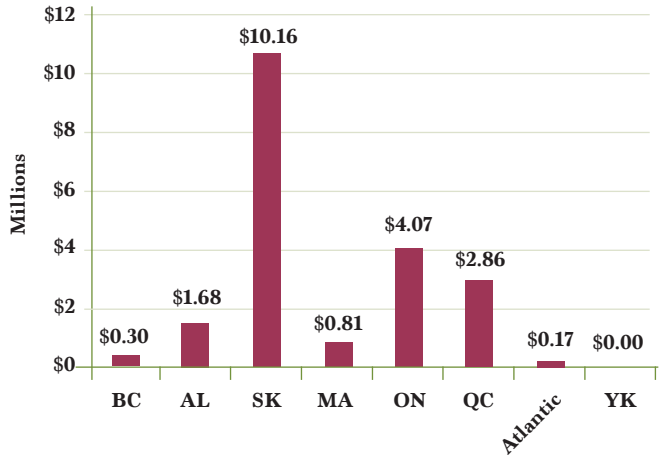
20 We used the same proportion of saved-seed (60%) to purchased seed (40%) from the Eco-Ressources study to estimate the seed market value of ecological growers.

Table 5 - Value of purchased and saved field crop seed (2012)	
Type of Seed	**Canada**
Organic growers	
Purchased Seed	
Conventional Untreated	**$5.79 M**
Organic / Pedigreed Organic	**$1.93 M**
Saved-Seed	**$11.57 M**
Ecological growers	
Purchased Seed	**$12.34 M**
Saved-Seed	**$18.52 M**
Total	**$50.15 M**

If organic growers continue sowing saved seed three out of five years on average, and purchase only organic seed, the market for organic field crop seed would grow by 300%, from $1.93 to $7.72 million.

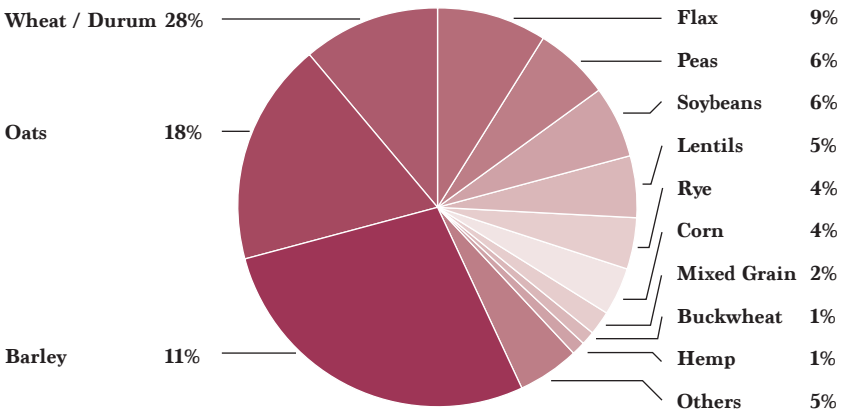
Capitalizing on the potential to grow the organic field crop seed market will not be easy, or fast. Complexities created by Canada's regulatory system were described earlier in this chapter. In addition, field crop producers, whether they practice organic or conventional production, are looking for seed of high yield varieties well adapted to their regional climate (e.g. good cold tolerance). It is not enough to simply increase organic seed production. As the new organic oat example illustrates, research and development is needed to increase the supply of high quality, high performing organic varieties, which will give producers the incentive to shift from conventional to organic seed.

Figure 10 – Organic and ecological field crop seed purchases by province (2012)



Saskatchewan accounts for half of the market of purchased seed, at $10.16 million. This province also ranks first in acreage (see below). Another third of the national market value is shared between Ontario ($4.07 million) and Quebec ($2.86 million).

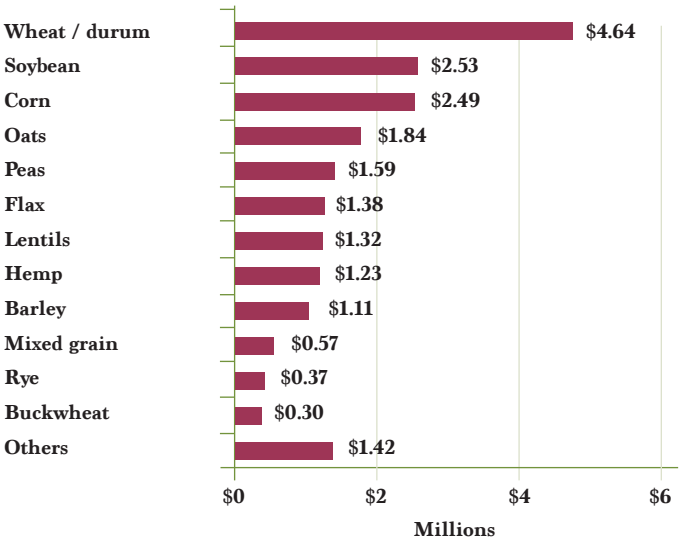
Figure 11 – Organic and ecological field crop acres by crop type (2012)



Wheat is the most important organic field crop in Canada, with more than a quarter of total production (202,000 acres), followed by oats (127,000 acres) and barley (82,000 acres). The "others" category includes over 30 different crops grown on more than 13,000 acres. Detailed information on organic and ecological acreage can be found in Appendix 2. It is important to note that field crops include corn used as livestock feed and for other food products. Sweet corn for human consumption is covered in the vegetables section.

Figure 12 shows the market for purchased seed of the top 13 crops. These crops together represent over 90% of the current organic and ecological seed market in the country.

Figure 12 – Organic and ecological field crop seed purchases by crop type (2012)



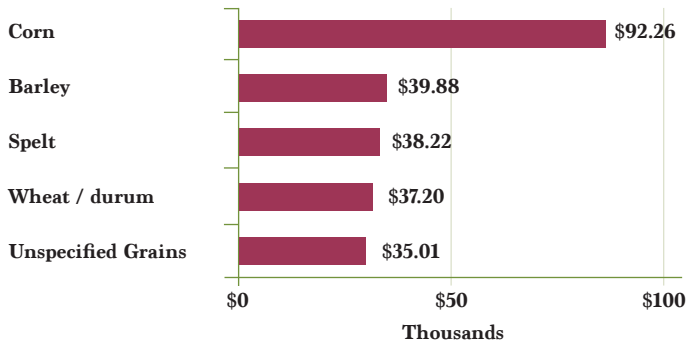
Wheat has the highest seed market value at $4.64 million. Due to their high seed costs, soybean and corn are second and third in value, even though they are respectively sixth and ninth in acreage. The category "others" at $1.42 million encompasses 19 crops, including kamut ($139,000), beans ($88,000) and mustard ($80,000). These figures are based on an assumed 30% purchase rate. However, organic field crop growers report that the percentage of saved seeds varies tremendously from one crop to another, which would affect the market value of these crops.

The next section details the market value of purchased field crop seed for each province.

BRITISH COLUMBIA

British Columbia, with 10,000 organic and 16,118 ecological acres in field crops, has one of the smallest market values, at $303,000.

Figure 13 – British Columbia top-five organic and ecological field crop seed purchases (2012)



Over 80% of the field crop seed market in BC is from the top 5 crops. Corn alone represents a third of the value in the province. The grains category ($35,000) includes all types of grains. The total market in BC is estimated at just over $300,000, which includes conventional untreated, ecological, organic pedigreed and organic common seeds.

Table 6 - British Columbia value of purchased and saved field crop seed (2012)	
Type of Seed	**British Columbia**
Organic growers	
Purchased Seed	
Conventional Untreated	**$87,495**
Organic / Pedigreed Organic	**$29,165**
Saved-Seed	**$174,990**
Ecological growers	
Purchased Seed	**$186,656**
Saved-Seed	**$279,984**
Total	**$758,291**

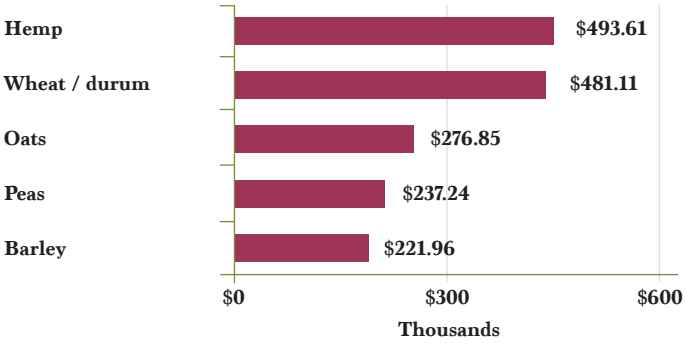
Table 6 shows that $274,000 could be injected into the organic seed industry in BC if ecological and organic growers were to only purchase organic seeds.

THE PRAIRIES

The Prairie Provinces account for 78% of the organic and ecological field crop area in Canada. Wheat/durum has the highest seed value in the region ($4.3 million), followed by oats ($1.6 million), and flax ($1.3 million). Due to their relative scale and significance, field crop data for the Prairies is disaggregated and presented by province, below.

Alberta

Figure 14 – Alberta top-five organic and ecological field crop seed purchases (2012)

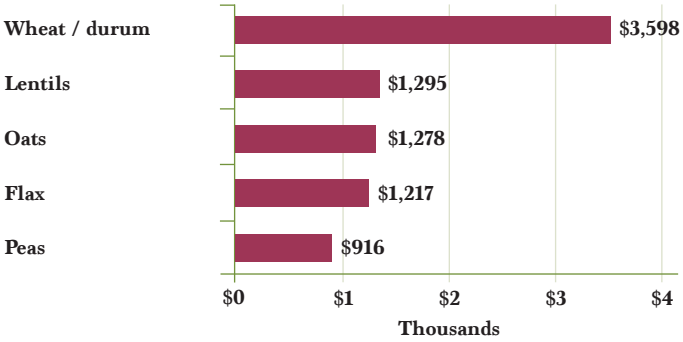


Approximately 20% of Alberta's total organic area is in field crops. There are an estimated 452,952 organic and 724,234 ecological field crop acres in the province. Alberta has at least 9,800 acres of organic and ecological hemp; it is the fifth most important field crop in acreage and the first in market value. Alberta ranks fourth in Canada in the value of purchased field crop seed. The fact that hemp growers are forbidden to save seeds and that seed cost per acre for hemp is very high explains this difference. In total, organic and ecological growers from Alberta purchase $1.68 million in field crop seeds annually.

Saskatchewan

Saskatchewan has the largest organic (452,900) and ecological (724,700) field crop acreage in Canada, and ranks first in market value. Over half of the organic acreage (56%) in Saskatchewan is in field crops.

Figure 15 – Saskatchewan top-five organic and ecological field crop seed purchases (2012)

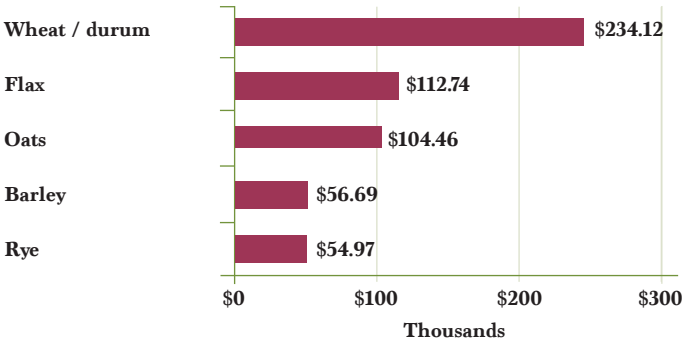


The market for purchased organic and ecological field crop seed in Saskatchewan is estimated at over $10.16 million, the largest in Canada. Growers in this province currently purchase $0.98 million in common organic and pedigreed organic seeds annually. Notably, Saskatchewan is the only market in which pulses rank in the top 5 crops with the highest market value.

Manitoba

In Manitoba, there are more than 37,000 organic and 60,000 ecological acres in field crop production. According to Manitoba Agriculture, Food and Rural Development (MAFRD), 71% of organic farmers in Manitoba grow field crops. In 2012, there were 84 organic farms that planted grains, oilseeds or pulses, as well as 6 organic grain cleaners and 15 certified organic grain processors (excluding wild rice) in this province.

Figure 16 – Manitoba top-five organic and ecological field crop seed purchases (2012)



The top 5 field crops represent 83% of the total organic field crops in Manitoba. The market for purchased organic and ecological field crop seed is estimated at $806,000, approximately half the value of the market of Alberta.

Table 7 - Prairies value of purchased and saved field crop seed (2012)

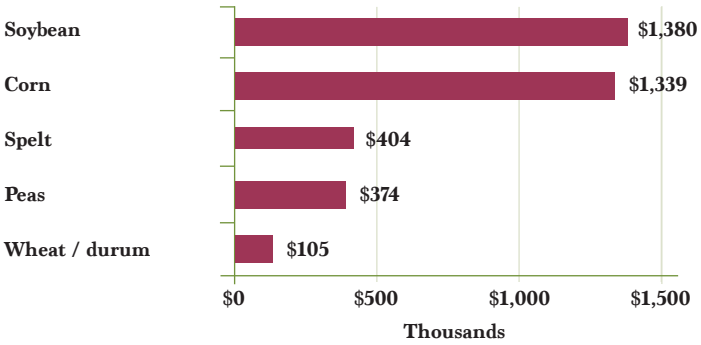
Type of Seed	Alberta	Saskatchewan	Manitoba
Organic growers			
Purchased Seed			
Conventional Untreated	**$484,141**	**$2,930,795**	**$232,746**
Organic / Pedigreed Organic	**$161,380**	**$976,931**	**$77,582**
Saved-Seed	**$968,282**	**$5,861,590**	**$465,492**
Ecological growers			
Purchased Seed	**$1,032,834**	**$6,252,363**	**$496,525**
Saved-Seed	**$1,549,251**	**$9,378,545**	**$744,787**
Total	**$4,195,888**	**$25,400,224**	**$2,017,133**

Table 7 shows the seed market for each Prairie province. The total organic market in this region is $1.21 million. If organic growers maintained seed-saving practices, and purchased only organic seed, $3.64 million would be injected into the organic seed industry in this region each year.

ONTARIO

There are over 83,000 organic acres and an estimated 134,000 ecological acres of field crops in Ontario. The current market for purchased organic and ecological field crop seed in the province is estimated at $4.07 million.

Figure 17 – Ontario top-five organic and ecological field crop seed purchases (2012)



Ontario is the largest organic soybean and corn grower in Canada. As illustrated in the figure 17, these crops have respectively the first-and second- largest market value in the province.

Table 8 - Ontario value of purchased and saved field crop seed (2012)

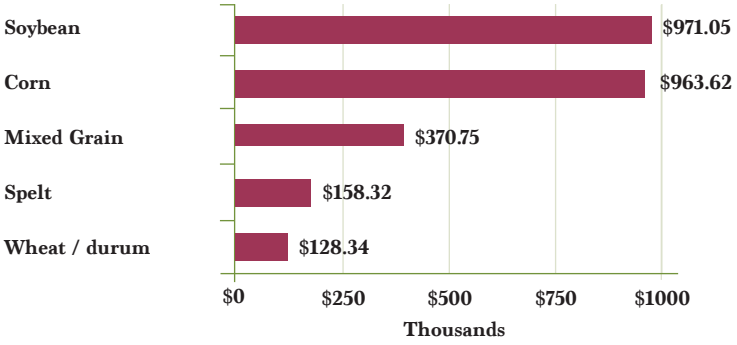
Type of Seed	Ontario
Organic growers	
Purchased Seed	
Conventional Untreated	$1,174,759
Organic / Pedigreed Organic	$391,586
Saved-Seed	$2,349,519
Ecological growers	
Purchased Seed	$2,506,154
Saved-Seed	$3,759,231
Total	**$10,181,249**

As Table 8 shows, ecological growers purchase $2.5 million of field crop seeds, and organic growers almost $1.57 million in Ontario each year.

QUEBEC

Quebec's field crop seed market is the third-highest in Canada, at $2.86 million. There are 54,000 acres in organic and 91,000 acres in ecological field crops in the province. In 2012, 323 farmers were cultivating organic field crop in Quebec.

Figure 18 – Quebec top-five organic and ecological field crop seed purchases (2012)



Over 48% of organic acres in Quebec are dedicated to field crops. As illustrated in figure 18, soybean occupies the top spot in market value. It is also the leading crop in acreage. At least 146 farmers grew organic soybeans in 2012.

Table 9 - QC value of purchased and saved field crop seed (2012)

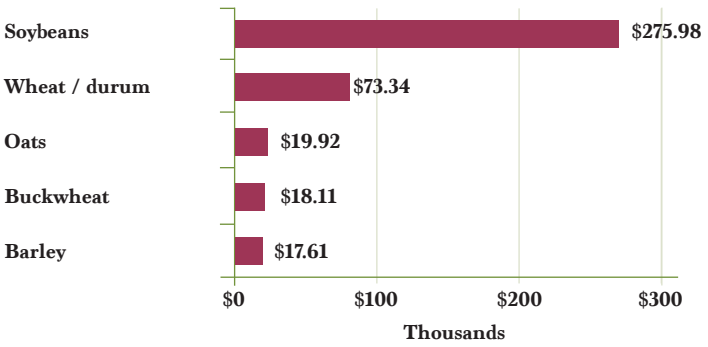
Type of Seed	Quebec
Organic growers	
Purchased Seed	
Conventional Untreated	$825,557
Organic / Pedigreed Organic	$275,185
Saved-Seed	$1,651,114
Ecological growers	
Purchased Seed	$1,761,188
Saved-Seed	$2,641,782
Total	$7,154,826

Quebec's ecological growers purchase $1.76 million of field crop seeds annually, and organic growers another $1.1 million.

ATLANTIC PROVINCES

There are almost 5,000 acres of organic field crops in the Atlantic Provinces.

Figure 19 – Atlantic Provinces top-five organic and ecological field crop seed purchases (2012)



Roughly 90% of organic and ecological field crop acres in the Atlantic Provinces are located on Prince Edward Island. Soybeans represent almost 40% of the organic and ecological acreage, and over 60% of the seed market value.

Table 10 - Atlantic Provinces value of purchased and saved field crop seed (2012)	
Type of Seed	**Atlantic Provinces**
Organic growers	
Purchased Seed	
Conventional Untreated	**$51,219**
Organic / Pedigreed Organic	**$17,073**
Saved-Seed	**$102,439**
Ecological growers	
Purchased Seed	**$109,268**
Saved-Seed	**$163,902**
Total	**$443,901**

The total market, saved-seed included, is estimated at $443,000. In purchased seed, ecological growers purchase $109,000 annually, and organic growers $68,000.

YUKON

The Yukon has a small seed market. A total of ten organic acres comprised of oats (4.9 acres), mixed grain (2.5 acres) and kamut (2.5 acres) were listed by CBs in this territory. The total value of saved seed and purchased seed is estimated at just over six hundred dollars and the market for organic and ecological field crop seed is estimated at approximately two hundred and fifty dollars.

4.2 CASE STUDY: THE HEMP SEED MARKET

Sixteen years ago Canada's Federal Government repealed the law against planting industrial hemp. Since then, Canada has led "the world market in terms of production and processing of industrial hemp for the food market" (Crawford, 2014). Hemp is different from most other crops as it is a controlled substance with a limited number of seed suppliers. This crop was selected as a case study for this research because of the unique regulation that frames its usage, as well as the increasing demand for industrial hemp in Canada.

Hemp can be grown as a dual crop (seed and fiber), uniquely for fiber or uniquely for seed. Acreage of hemp in Canada (conventional and organic) has more than doubled since 2011, from 40,000 to over 84,000 (estimated) acres in 2014 (Crawford, 2014). Between 2013 and 2014, the number of acreage increased by 25%. Historically, Alberta has been the largest producer, followed by Saskatchewan and Manitoba (Laate, 2011). Our research indicates that between 2013 and 2014 17% to 25% of the acreage in the country was organic[21]. Farmers are expected to seed 100,000 acres of hemp (conventional and organic) by 2015 and 250,000 by 2018 (Tait, 2014).

The regulatory system for the commercialization of industrial hemp is administered by the Office of Controlled Substances of Health Canada. The system operates by issuing licenses for all activities involving hemp (AAFC, 2013). Seed procurement for food and non-food purposes is strictly regulated. It is prohibited to save seeds; hemp farmers must buy seeds from licensed growers and seeds must be of pedigreed status. There are 5 licensed seed growers in Canada: Parkland Industrial Hemp Growers, Hemp Genetics International, Phytogene Resources, UniSeeds and Terramax. Hemp is generally resistant to disease. For this reason, no pesticide is registered yet in Canada for hemp, which means it cannot be used even in conventional production. This may change soon, since minor use regulations for pesticides are being developed (Crawford, 2014). For the time being, much of the production is considered ecological.

21 It was not possible to confirm the number of acres of certified organic hemp using CB data because the information for Manitoba was incomplete (only 22 organic acres listed by the CBs consulted, though it is the country's largest growing region for the crop). COTA calculated that Canada had at least 9,472 certified organic acres in 2012, including 3,796 in Alberta and 4,942 in Saskatchewan. This is a conservative estimate.

The market is highly vertically integrated and concentrated in the Prairies, where hemp is used as part of a typical crop rotation. Hemp is a value-added industry in which 85% to 95% of the acreage is contracted by processors every growing season. There is high demand for organic hemp seeds (Crawford, 2014). According to the Canada Hemp Trade Alliance, the 2014 harvest season production contracts averaged $0.80/pound for conventional hemp seed producers, and almost double that amount for organic growers.

Exports increased by 25% in the past year, jumping from $40 million in 2013 to $50 million in 2014 (Crawford, 2014). As the social acceptability of hemp products grows, so does demand. The Canadian hemp market is expected to pursue its growth, but may soon have to compete with the US. Our neighbouring country is currently the most important market for Canadian hemp seed products ($38 million of exports in 2013). US laws prohibited the production of industrial hemp until recently, but new pro-hemp legislation at the state and federal level may launch the local production of hemp for industrial purposes.

Future growth of the sector relies on the development of new market opportunities, notably in the feeding industry (livestock feeds) and the fibre products industry (Franz-Warkentin, 2012; Crawford, 2014). The growth in organic hemp and tight regulations on seed procurement make it an interesting option for development of the Canadian organic seed market. Our research suggests that in a very short time organic hemp seed has become one of the higher-valued specialty crops, very close to the seed market for one of Canada's field crop stalwarts: soy.

4.3 CASE STUDY: THE SOYBEAN SEED MARKET

Soybean is a major crop in Canada, with over 4.2 million acres cultivated annually. Consumer awareness on GMO issues is increasing the demand for non-GMO soybean, thereby creating market opportunities for ecological and organic growers. Production is concentrated in 4 provinces: Manitoba, Ontario, Quebec and PEI. According to the Canadian Soybean Council (CSC) (2012), 21% of all soybean acres in these provinces are Non-GM[22]. Approximately 20,000 MT of non-GM soybeans are used for food applications annually in Canada (CSC, 2012).

Statistical analysis from the CSC shows that even though non-GMO acreage grew steadily over the past 3 years, the ratio of non-GMO to GMO crops has been declining; for Quebec the ratio declined from 51% to 27%, in Ontario 35% to 25%, and PEI 25% to 23%. The ratio of non-GMO to conventional crops stayed consistent in Manitoba at 5%. Table 10 estimates the market for non-GMO and organic soybeans for the four main soybean-producing provinces.

Table 11 - Market value of non-GMO and organic soybean seed (2012)

Province	Total Production	NON-GMO			ORGANIC		
	# Acres	% of total	# Acres	Estimated market value	% of total	# Acres	Estimated market value
Manitoba	844,677	5%	42,233	$2,166,445	0.1%	864.7	$54,789
Ontario	2,650,056	25%	662,514	$33,986,968	0.9%	24,176.98	$1,531,611
Quebec	721,547	27%	194,817	$ 9,994,112	2.4%	17,013.48	$1,077,803
PEI	55,000	23%	12,650	$ 648,945	3.4%	1,860	$117,831
Total	4,271,280	21%	912,214	$46,796,470	1%	43,915.16	$2,782,034

Source: Canadian Soybean Council, 2012 & COTA, 2013

22 Non-GM seeds are identity preserved (IP) seeds. Growers require signing a contract with the seed companies and following detailed production and management protocol (CSC, 2012). However, some restrictions that affect the organic production are not applied to non-GM production, i.e. the usage of chemical fertilizer and other agricultural chemical inputs. Certified organic growers are using GM free seeds, and their production is regulated under the *Canadian Organic Standards* (COS).

Acreage information in Table 10 is based on data collected by COTA for this study; other data were sourced from the CSC (2012). Only 1% of the soybean acres in the country are certified organic. Canadian provinces other than the four listed above grow at least 434 acres of organic soybeans[23], adding another $27,493 to the seed market value.

23 Saskatchewan (311 acres), New Brunswick (123 acres).

CHAPTER 5 FIELD INSPECTORS SURVEY

This section provides results from an online survey of organic field inspectors in Canada. Inspectors provided observations from their personal experience. In addition to general questions about organic seed, the survey focused on the demand for derogation[24] from the obligation to use organic seeds in organic production. Organic inspectors oversee several fields annually, deal with various types of production, and are aware of general trends and issues in seed procurement. This unique perspective makes organic inspectors an important group to survey about seed sourcing on organic farms.

The goals of the survey were:

To identify the most common derogation for vegetable seed and field crops

To determine if derogation requests have been increasing, maintained or decreasing over the past two years

To get a general overview of the issues and trends regarding seed derogation in Canada

Methodology

The online survey was conducted over a two month period from early October to the end of November 2013. The survey was voluntary, anonymous, and available only in English. It was composed of 12 questions[25]. Six of these were multiple-choice, and the other six were open questions meant to explore the derogation issue in more depth. Since the survey was composed predominantly of non-mandatory questions, the number of respondents varies question to question. Answers were based on personal experience and results should be considered "observation-based".

The survey was composed of four sections. The first established a portrait of respondents; the second and third explored questions related to seed procurement for vegetables and field crops; and the last section included questions on exemption and organic pedigreed seeds. The full survey is provided in Appendix 3.

Seven Certification Bodies (CBs) sent the survey to inspectors through their distribution lists, including one American-based CB. Canadian members of the International Organic Inspectors Organization (IOIA) were also sent the survey link via email. A total of 33 inspectors responded, together covering all agricultural regions of Canada. The number of organic inspectors nationwide is not monitored by any agency. The IOIA lists 41 Canadian members in their directory. However, according to various sources, the number of organic inspectors in Canada likely ranges between 100 and 120. Considering that not all inspect fields (ex: some inspect organic processors), the survey respondents can be estimated to represent approximately one third of organic field inspectors in Canada.

5.1 PORTRAIT OF SURVEY RESPONDENTS

The respondents were asked to specify in which provinces they had conducted field inspections in the last two years. They were allowed to indicate as many provinces as applicable. The number of responses therefore doesn't equate the number of respondents.

24 Canada's *Organic Products Regulations* require organic farmers to use certified organic seed when it is available. However, an exemption (derogation) may be permitted if certifiers are satisfied that obtaining organic seeds is not feasible for the producer.

25 One mandatory and eleven optional questions.

Table 12 - Geographic distribution of inspections by respondent		
Province	**Number of responses**	**Percentage**
British Columbia	**5**	**15.2%**
Alberta	**6**	**18.2%**
Saskatchewan	**10**	**30.3%**
Manitoba	**3**	**9.1%**
Ontario	**17**	**51.5%**
Quebec	**9**	**27.3%**
New Brunswick	**3**	**9.1%**
Nova Scotia	**4**	**12.1%**
Prince Edward Island	**3**	**9.1%**
Newfoundland	**1**	**3%**
Yukon	**1**	**3%**
Total number of respondents		**33**

Together, the inspectors who responded cover all the agricultural regions of Canada. The majority (55%) have been conducting inspections in one province for the past two years, 21% in two provinces, 12% in three provinces and 12% in four provinces or more.

Questions 2 and 3 determined the experience of the respondents and the number of operations they inspect on average per year. Respondents had on average 7.5 years of experience, with a range of 1 to 24 years[26]. They indicated inspecting between three to 200 operations, with an average of 54 operations per inspector each year[27]. Combined, they inspect on average 1,745 operations annually.

5.2 VEGETABLE SEEDS

Three questions in the survey related to vegetable seed procurement. First, respondents had to identify, to the best of their knowledge, which derogations were the most common for vegetable seed crops for the past two years. They were allowed to list up to five different crops.

To avoid influencing respondents, the question was open[28]. Inspectors were asked to write the name of the vegetable crop and estimate the percentage of farmers growing this crop who requested derogation. The table below shows the top 5 vegetable crops cited by respondents. The right column shows the average proportion of farmers who requested derogation for each crop, as perceived by inspectors.

26 The total number of respondents for this question was 32; one answer was discarded.

27 The total number of respondents for this question was 32; one answer was discarded.

28 Six answers were disregarded for this question; one answered that they only inspected a few vegetable farms and did not feel comfortable answering the question, one gave field crops as an answer (we included this response in the field crop section), and three answered that derogations were used for all vegetables.

Table 13 - Top-five vegetable seed derogations		
Crops	**# Answers**	**Derogation request- average**
Potatoes	**10**	**77%**
Carrots	**7**	**70%**
Tomatoes	**5**	**78%**
Beans	**5**	**69%**
Onion sets	**4**	**65%**
Sweet corn	**4**	**59%**

Total number of respondents	**23**
Total number of answers	**51**

Potatoes were identified by 43% of respondents as one of the five most common exemptions. Four respondents noted sweet potatoes as one of the top five vegetable seed derogations; on average respondents estimated that 73% of organic farmers ask for derogation for sweet potatoes[29]. This is not surprising since potato tubers are at risk of high virus levels and possible blight spore which are very difficult to control in organic production. Greenhouse tomatoes, tomato-grafting varieties, and greenhouse cucumber seeds were identified as always sourced non-organically. One respondent provided this explanation of derogations for vegetable seeds:

> *"[derogations are common for] all vegetable types, doesn't seem to matter what vegetable it is, more that every producer wants a certain variety of a vegetable and can't get it in an organic source. Once they have it, most producers save seed if possible."*

Verification officers were also asked to list the two greatest challenges that farmers cite when requesting derogation for vegetable seed crops.

Table 14 - Reasons for requesting derogation for organic vegetable seed	
Challenges	**Number of answers**
Specific varieties not available	**24**
Insufficient quantity of seeds available	**13**
Price is too high	**6**
Low germination rate	**6**
Other: No vegetable farm inspected	**2**
Varietal integrity	**1**
Weed contamination	**0**
Possible GMO contamination	**0**
Total responses	**50**

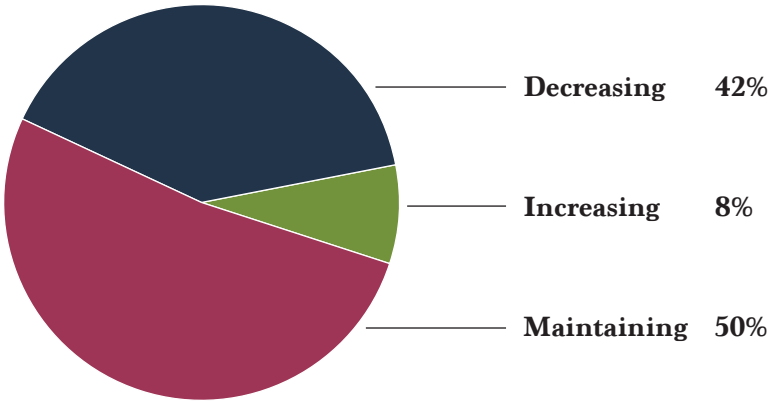
Total number of respondents	**27**

29 The survey did not allow the respondents to specify if potato seed derogations were for "true seed" or for tubers.

Survey respondents identified the lack of availability of specific varieties as the most important challenge, followed by insufficient quantity, price, and low germination rate. Interestingly, even if high price is not an acceptable reason to obtain an exemption under the Canadian Organic Regime, 22% of respondents identified high seed costs one of the two biggest challenges cited by farmers when requesting a derogation. While price is an important factor, our research supports previous findings by Eco-Ressources (2011) that variety, quality and quantity are more important than price in determining whether a producer will opt for organic seeds[30].

Respondents were asked whether the demand for derogation for organic vegetable seeds had been increasing, maintained or decreasing for the past two years. Over half of the inspectors observed no change over the last two years. Another significant proportion of the respondents noted a decrease. In total, 23 of 25 respondents perceived that the demand of derogation for vegetable seeds had been maintained or decreased over the past two years.

Figure 20 – Trends in requests for derogations for organic vegetable seed



Total number of respondents	25

5.3 FIELD CROPS

Inspectors responded to the same set of questions on seed procurement for field crops. As in the vegetable section, they identified the five most common derogations and estimated the percentage of farmers growing these crops who requested derogation[31]. Table 15 shows the top 6 crops identified by respondents. The three derogations most commonly cited were corn, soybean and wheat, together making up 40% of all the answers.

30 All Certification Bodies (CBs) follow the Canadian Organic Standard (COS), but they can differ in their interpretation of the COS. These differences can affect what is considered a legitimate reason to request derogation, so the results may be influenced by the CBs, or even by the inspectors themselves.

31 Two answers were disregarded for this question. One respondent gave vegetable varieties as answers, and these comments were included in the vegetable seed section.

Table 15 - Top field crop exemptions		
Crops	**# Answers**	**Derogation request- average**
Field corn	**15**	**64%**
Soybean	**13**	**58%**
Wheat	**10**	**46%**
Oats	**9**	**51%**
Barley	**6**	**47%**
Peas	**6**	**57%**

Total number of respondents	**28**
Total number of answers	**91**

At least half of respondents identified corn as one of the five most common derogations. Wheat was the third most cited answer, with ten respondents including this crop in their top five. Hard red, soft white, spring wheat and durum were among the varieties identified. Peas were the fifth most common crop, including: field peas, yellow peas, and peas for mixed grain. Rye and flax tied for sixth most common exemption, with four answers each.

Some respondents identified special crops in their top five most common exemptions; for example sunflower seeds (one answer) and mustard seeds (one answer) were cited as always sourced non-organically. Important to note, forage seeds were mentioned by many, amongst them: hay mix, alfalfa and clover. Two respondents also included cover crops (green manure) in their top five: tillage radishes and "other cover crops".

Respondents then identified the two greatest challenges farmers cite when requesting derogation for field crops. Table 16 presents the compilation of the results.

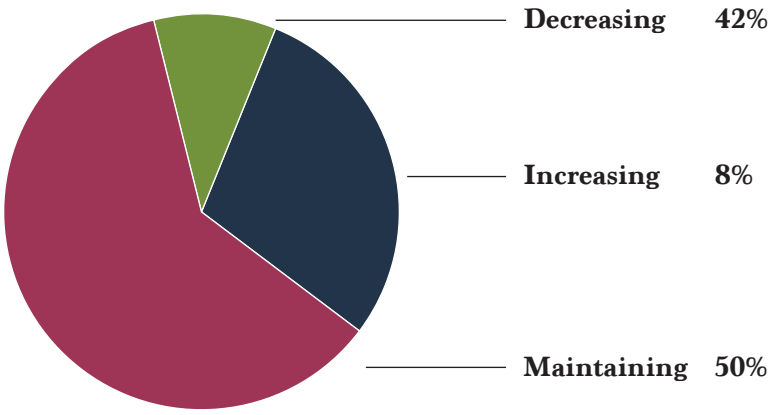
Table 16 - Reasons for requesting derogation for organic field crop seed	
Challenges	**Number of answers**
Specific varieties not available	**23**
Insufficient quantity of seeds available	**19**
Varietal integrity	**2**
Price is too high	**5**
Weed contamination	**3**
Low germination rate	**3**
Possible GMO contamination	**0**
Other	**3**
Total responses	**58**

Total number of respondents	**32**

Again, the lack of availability of specific varieties ranked first, representing nearly 40% of total responses. Availability of seed was also cited as among the two greatest challenges for at least 70% of the respondents. The difficulty of procuring seeds in bulk quantities was the second most significant challenge cited by farmers to the verification officers. Even though price alone is not an acceptable reason for seed derogations under Canada's organic standards, 15% of respondents cited that high cost of organic field crop seeds played some role in derogation requests.

The trends in the demand for derogation are illustrated in figure 21. Respondents were asked their opinion on whether demand for derogation for field crops had been increasing, maintained or decreasing for the past two years. Contrary to results for vegetable seeds, more respondents observed an increasing trend in the demand of exemption for field crop seed. Overall, 28 of the 31 respondents reported that the demand for derogation had stayed steady or increased over the past two years.

Figure 21 – Trends in requests for derogations for organic field crop seed



Total number of respondents	31

5.4 SITUATIONS IN WHICH DEROGATION WAS DENIED

To further our understanding of the demand for derogation, survey respondents were asked if they encountered a situation in which derogation was requested but denied. The vast majority, 27 of the 31 respondents, said that they never encountered such a situation. The four respondents that cited occasions when derogations were denied were asked to explain. Three respondents answered, as follows:

> *"The seeds were available from other sources"*
>
> *"The derogation was requested due to high cost of organic seeds"*
>
> *"They [the grower] used treated seeds"*

This dynamic is addressed by recommendation "developing a consistent approach to derogations" under section 6.2.1.

5.5 COMMENTS FROM INSPECTORS

When asked if they noticed other trends or had any other insights to offer on the issue of derogation, 16 inspectors responded. All the comments raise important issues. They can be grouped into three categories: shortage of organic seeds in Canada, lack of guidance on how to treat derogation requests, and factors influencing the usage of conventional seeds. A complete list of the comments is provided in Appendix 3.

Some inspectors found divergent interpretations of the derogation rules problematic. They suggest that some farmers make real efforts to purchase organic seeds, while others do not.

> *"There is a lack of knowledge or maybe better terminology there is a selective understanding of the Canadian Organic Standard, so some producers do the minimum to get by under the organic standards."*
>
> *"Some producers really look hard for organic seeds, others hardly at all, they write down three sources that said no, and the CBs accept that... I think CBs should increase the expectation of organic seeds."*

Another concern is a lack of guidance from CBs on what constitutes a valid reason to obtain a derogation:

> *"I am finding that the certification bodies and file review staff do not give any critical assessment when deciding on a derogation. The responsibility of assessment is placed on inspectors with insufficient instruction as to what constitutes a valid reason (…) I think the assessment needs to occur at the certification level the same way input assessment does."*

Other inspectors stress inadequate commercial markets for some seed varieties and other factors such as cost, weed seed contamination, location of the seed growers, etc.:

> *"It feels like many organic farmers are being forced to use inferior seeds because of the organic rules."*
>
> *"The seed industry is not interested in producing seed organically as the pedigree seed industry has weed contamination standards that are difficult to meet, and the volume of seed demand is very small when compared to the conventional seed business, and lastly there is the problem of segregation of seeds. If the company producing the seeds is in conventional and organic production, I would argue it is not possible to segregate unless there is dedicated equipment in place for both systems. There really is a shortage of organically produced, pedigree seed available. Common [non-pedigreed organic] seed is available, but often does not have good standards in place for weed contamination, or disease control, or seed quality etc."*
>
> *"The [pedigreed] organic seeds are most of the time not available if ordered late. Sometimes, the producer waits until late spring to order so the [pedigreed] organic seeds are back order and then, they buy non-treated seeds so it's cheaper. Also, in some area, the supplier has in stock only a few organic seeds mostly for grains. No [pedigreed] forage grains are available in organic in many areas in Quebec and Maritimes. So it will be ridiculous for producers to ask derogations all the time. The volume available as [pedigreed] organic, since I started in 2006, did not increase a lot! I know two producers who grow [pedigreed] organic seeds (wheat and oat) conforming to the COR and CSGA, but because they live too far, no supplier wants really buy those seeds (too expensive, and/or no storage for segregation, etc.) so they sold as conventional. Sadness..."*
>
> *"Commercial markets for many organic seed varieties do not seem to exist. The only way for such a market to develop is to stop allowing seed rule exemptions."*

One respondent indicated that few growers are doing field trials on organic seed varieties.

> *"Very few of the growers, when I asked more questions, had done actual field trials to verify this, they just assumed from anecdotal evidence that their assumptions were justified, and requested derogation or did paper seed searches to show compliance to the COS requirements."*

One inspector also raised the fluctuating nature of derogation demands, noting that sometimes the shortage of organic seed is temporary.

5.6 CONCLUSION OF THE FIELD INSPECTORS SURVEY

The survey allowed those best positioned to observe trends in organic seed to identify issues based on their experience in the field. We draw five conclusions from this exercise:

Most of the time, derogations are granted to organic growers.

The majority of field inspectors (92%) have not seen an increase in the demand for vegetable seed exemptions in the past two years.

The majority of field inspectors (70%) have not seen an increase in the demand for field crop seed exemptions in the past two years. However, a third of the respondents did report an increase in exemption requests.

Farmers cited availability, quantity, germination rates and cost as their greatest challenges when requesting derogation for vegetable seed crops.

Inspectors need more guidance in dealing with exemption requests.

In a follow-up interview after the survey, one inspector expressed appreciation for this research process. The respondent felt the survey and research shed light on and increased awareness among inspectors of seed issues in the organic certification process. Furthermore, the survey provided an opportunity to acknowledge the inspectors' important role and unique point of view.

CHAPTER 6 CHALLENGES AND RECOMMENDATIONS

6.1 BARRIERS TO THE DEVELOPMENT OF THE ORGANIC AND ECOLOGICAL SEED INDUSTRY IN CANADA

This section cites barriers encountered throughout this study as well as those highlighted by seed retailers, grain buyers, small-scale seed producers, farmers and researchers during interviews conducted in the fall of 2013. Challenges are grouped in two categories: systemic challenges and market-related challenges.

6.1.1 SYSTEMIC CHALLENGES

A variety of systemic challenges were identified in previous research (i.e.: BFICSS, 2013; OSA, 2011; Eco-Ressources, 2011 etc.). These are here briefly noted:

Supply-demand paradox	**As identified in the BFICSS Pilot Year Report (2013), a supply-demand paradox occurs when seed suppliers question if demand justifies scaling up production, while buyers find the supply insufficient. This paradox slows the growth of the organic and ecological seed industry in Canada.**
Derogation impasse	**Some attribute the shortage of organic seeds to derogation and recommend tightening the requirement for organic seed usage in organic production. Others believe it would be punitive to remove the exemption option for organic producers due to the shortage in supply of organic seed in Canada. Last but not least, some see the attempt to regulate organic and ecological seeds as a threat to biodiversity.**
GM / GE contamination	**Integrity preservation and GM/GE contamination risk management are burdens for organic growers, and GM/GE contamination is a systemic threat to ecological and organic farming systems. The most common source of contamination is drift from neighbouring fields growing GM/GE crops. Contamination can also come via seeds from producers who do not use proper segregation techniques. One of the most commonly cited issues in purchasing organic field crops was the high levels of weed and GM/GE contamination at the source. Corn and soybeans were the crops cited as most problematic.**
Breeding based on non-organic practices	**Very few breeders invest in genetic advancements for organic crops and varieties in Canada. Royalties paid by ecological and organic growers are usually invested in non-organic plant breeding. This lack of development is exacerbated by the divestment in public plant breeding by the federal government.** **This research identified two additional systemic challenges not mentioned in preceding studies: a general lack of data and the perception of the sector as a marginal market.**

Lack of data	**In Canada, data on the organic sector is scarce and inconsistent. The sector relies on voluntary disclosure from stakeholders to analyze organic market segments. Acreage is one of the most important pieces of information needed to understand the growth of organic agriculture, and consequently, the potential for an increase in demand for organic and ecological seeds[32]. This data is not collected at the federal level, and the most recent agricultural census does not include information on organic acreage. At the provincial level, only Quebec compiles this type of data. Thus, to get information on organic acreage, each of the nineteen Certification Bodies operating in Canada must be contacted individually, and agree to disclose data voluntarily.** **In contrast, Canada's conventional seed sector is well organized and collects information on its growth, market and trade value. We see through this example that it is possible to collect this kind of information, but the organic and ecological segments are not currently included. The Canadian Seed Growers' Association (CSGA) has information on the number of growers and inspected acres of pedigreed seeds by crop and variety. However, it is not part of their mandate to carry statistics on organic pedigreed seeds. Statistics Canada produces monthly reports on seed exportation and importation by crop. The Harmonized System Codes (HS Codes) are an internationally standardized classification system of names and numbers for traded products, used to track down information for conventional seed. To date, HS Codes have not been assigned to organic seeds. This lack of information prohibits the sector from quantifying and tracking change in the use of organic and ecological seeds in Canada.** **For many farmers, information on regional organic and ecological seed suppliers is much more relevant to their day-to-day activities than a larger assessment of the seed market. Some cited the lack of a centralized organic and ecological seed database with breakdowns of regional and local information as a barrier to the growth of the industry.**
Perception	**Interviewees noted that despite the expansion of the organic movement in Canada, in contrast to many other countries, it is still viewed as marginal by government officials and large seed suppliers. Some suggest that a change in this perception is essential for the organic and ecological seed market to grow.**

32 The consistent growth of the organic acreage doesn't go necessarily hand in hand with the growth of the demand for organic seeds, since growers have the option of using derogation.

6.1.2 MARKET RELATED CHALLENGES – VEGETABLE SEED

Three main challenges were identified for the vegetable seed market. These are mostly encountered by small seed producers and new organic growers.

Lack of local analysis and insufficient structure to sustain the market	**As mentioned in the BFICSS Pilot Year Report, vegetable seed producers need confidence that there is a solid market for their products before they scale up. They also need information on the attributes organic growers look for in seeds (i.e. taste of the produce). The lack of information on regional and local vegetable markets and the lack of formal or virtual structures connecting seed producers to other stakeholders in their local organic/ecological value-chains are viewed as major obstacles to growth. Small seed producers interviewed underlined these issues as particularly problematic.**
Insufficient seed quality assessment and assurance	**Large-scale producers and growers rarely buy seeds from small organic or ecological seed producers. Barriers that hinder purchase include lack of availability of bulk quantities, price competitiveness, and a general perception of uneven seed quality. Seed producers and retailers highlighted uneven seed quality and lack of vegetable seed trials as important challenges. Many Community Supported Agriculture (CSA) growers and small organic farmers called for more trials and online dissemination of results. This would help growers learn about quality, climate adaptation, and other characteristics of seeds available in their regions.**
Lack of research and educational programs	**There are close to no public vegetable seed breeding programs in Canada, as research has historically focused on field crops. Combined with the absence of vegetable breeding programs in academic institutions (in contrast to those offered in the US and Europe), there is a serious lack of research and development of vegetable seeds. This weakens the potential growth of the organic and ecological seed market.**

6.1.3 MARKET RELATED CHALLENGES - FIELD CROP SEED

In 2012, field crops occupied 38.5% of the certified organic area in Canada, but only 2% of total field crop acreage. This segment faces the challenge of being currently too small of a market for conventional field crop seed producers. Organic seed producers interviewed listed four main obstacles to growth:

High-risk market / volatile consumer	**Customer retention is problematic for smaller organic field crop seed producers. It is not uncommon for these producers to sell seed to a niche market, and then lose customers after a few growing seasons. Widespread seed saving of field crops can account for much of this loss, and customer retention is also an issue for conventional producers.**
Lack of market incentives to develop organic pedigreed seed varieties	**Large seed suppliers that carry licenses over organic pedigreed seed varieties control production of those varieties. If they choose to opt out of production of given variety in favour of another, that variety becomes unavailable to producers. This diminishes the number of varieties of organic pedigreed seeds available in the country, and favors seed-saving practices. Combined with the relatively small size of the organic market, these factors hamper the development of organic pedigreed seed varieties.**

Growers opt for untreated seeds when renewing the gene pool	**Many growers opt for conventional seeds (pedigreed or not) when they purchase seeds to renew the gene pool in their fields after saving seed for a few years. This preference is due to field crop growers entering in contracts with grain millers for particular cultivars, seed characteristics, and quality, and related to the constraints imposed by Canada's Seeds Act and Seeds Regulations, most notably the variety registration system, which limits the sale of seed to seed produced through the pedigreed seed system.**
Lack of understanding of the informal field crop seed market	**As noted in other research (Eco-Ressources, 2011; BFICSS, 2013), seed saving is common in field crop production. One of the challenges highlighted by interviewees is the lack of regional information on seed saving practice by crop type. An interviewee mentioned this challenge:** **"If farmers are saving 75% of their own seeds, it makes it pretty hard for seed growers to invest in growing several different cultivars just for 25% of the production. The informal market for field crops needs to be assessed if we want to develop new cultivars and scale up organic and ecological production of already existing varieties."** **Producers could manage some of the risks associated with growing organic and ecological field crop seed if they had an understanding of regional seed saving practices (e.g. by province or on a smaller scale). Seed producers would be able to assess the demands for certain varieties and to invest in seed productions that fulfill the needs of local growers.**

6.2 OPPORTUNITIES AND RECOMMENDATIONS

This research represents one of the first attempts to collect information directly from the organic and ecological seed industry in Canada at a national level, and to make market estimates based on organic acreage.

Several constraints limit data collection and restrain analysis of this complex market. This section includes recommendations for future research, and opportunities to further the development of this sector. Implementing these recommendations would improve understanding of the ecological and organic seed sector, help overcome barriers of the supply-demand paradox, and improve the visibility of this market in Canada.

6.2.1 OPPORTUNITIES FOR SECTOR DEVELOPMENT

Supporting scaling up	**Results of interviews conducted for this research indicate that in several agricultural regions, organic and ecological seed growers are eager to scale up production. The continuous growth of the organic market combined with low market penetration of the local seed industry show that there are viable opportunities for seed growers. The assistance that could help these producers scale up and meet the quality and consistency requirements from larger buyers should include the development of educational tools, financial support, and shedding light on regional market opportunities. The latter can be achieved through ongoing market research, as well as support for vertically integrated relationships between seed growers and other stakeholders in the organic value chain.**
Identifying crops best suited for larger seed producers	**There are market opportunities for larger organic seed producers, but these opportunities are specific to certain high-value varieties in specific regions. The lack of information on regional demand for organic and ecological field crop seed prevents producers from capitalizing on specific demands by growers. Understanding regional seed saving practices would help producers manage risks. More research is required on the demand for organic and ecological field crop seed.**
Developing a consistent approach to derogations	**Inspectors have underlined the lack of guidance on how to treat derogation requests and the divergent interpretations of the *Canadian Organic Standard* by CBs. A clear and consistent approach on derogation needs to be developed and applied throughout the country, and further clarification on the procedures for granting exemptions is necessary.**
Supporting vertically integrated relationships	**Seed growers interviewed stressed the importance of understanding local market needs and opportunities (What do farmers, restaurants owners and the food processors in my region need? Are there any gaps in my local seed industry or niche ecological or organic seed markets that could be developed?). This understanding can be built by helping regional seed growers, farmers, processors, natural health stores or specialty retailers and restaurant owners network and build relationships. Possible formats include regional organic value-chain working groups, or informal networking on an as-needed basis to evaluate regional needs and market potential. Establishing dialogue between various stakeholders will help seed growers be recognized as an integral part of the local value-chain. Dialogue will also facilitate insight on ever-changing market needs.**
Developing a national strategy to showcase Canada's organic and ecological seed sector	**The organic and ecological seed industry would benefit from a coordinated national strategy to develop recognition of local seed companies as part of the organic value-chain, offering quality, consistency, and a good procurement option for Canadian farmers and gardeners. Key elements of this strategy would be building awareness of the importance of funding organic seed research and development, and ensuring participation of organic seed producers at the Organic Value Chain Roundtable (OVCRT) and sub-committees.**

Highlighting the organic seed market in the "Think" campaign and future organic campaigns	**Information on the advantages of a strong Canadian organic and ecological seed market could also be featured in the "Think Canada Organic Campaign", the national brand strategy for Canadian organic products. This would increase the visibility of the organic seed sector, and highlight its development as an important part of sustained growth of the Canadian organic sector as a whole.**
Strengthening relationships with certification and verification bodies	**Information on seed acreage is crucial to understand sector trends and obtain accurate estimates of the demand for organic and ecological seed. Since organic acreage information is scattered between the 19 CBs active in Canada, and all these entities use different data collection mechanisms, accessing and compiling acreage information is laborious and sometimes costly. It would benefit the sector to strengthen relationships with CBs, pursue dialogue at the national level and reinforce the importance of information sharing. Strengthened connections with CBs can also lead to better relations with verification officers, since CBs are the primary point of contact with growers. Another possible avenue to explore is accessing acreage information via Conformity Verification Bodies[33] (CVBs) instead of, or as well as, CBs. There are only four CVBs in Canada and working with them directly could move the sector toward a more consistent form of data collection.**

6.2.3 RECOMMENDATIONS FOR FUTURE RESEARCH

This analysis highlights ways to improve data collection and better track the organic seed market on an ongoing basis. The first two items listed below are the most important research gaps to fill to understand which crops and varieties are being saved for seed, which are bought, and where they are being sourced.

Conduct an annual, nationally-coordinated collection of organic acreage data	**This will help the organic sector monitor growth, and help organic and ecological seed industries estimate demand for seeds. The results could be published annually and used by the seed industry as a strong marketing tool to change the general perception of the organic sector as marginal and showcase the growth of the sector nationally. The future estimation should include information on forage crops because they are important crops for the organic sector, notably for producing organic dairy products and meat.**
Conduct anonymous surveys with field crop farmers on seed saving practices	**There is a need for more information on seed saving practices and procurement preferences from farmers who cultivate organic field crops. The sensitive nature of seed procurement demands an anonymous survey. The survey could also provide an idea of specific cultivars the farmers are after, and which seeds they are least likely to save. This information could then be shared with developers, facilitating a more responsive organic seed program relevant to producers' needs.**

33 CVB is an organization that has an agreement with the Canadian Food Inspection Agency under subsection 14(1) of the *Canadian Food Inspection Agency Act* to assess, recommend for accreditation and monitor certification bodies (CFIA, 2012).

Conduct an inspector survey on the use of ecological and organic seeds and trends among organic farmers	**Organic inspectors are at the centre of the certification system; with their collaboration it is possible to monitor trends (e.g. derogations, cultivars used, etc.). An annual verification officer survey could be developed in collaboration with IOIA and CBs, beginning with monitoring the use of specific ecological and organic seeds. This could be a cost-effective method to get information on particular seed varieties and trends. The survey would be introduced to verification officers in the spring, who could then gather information from farmers during the growing season. This technique could lead to more accurate results and a higher participation rate.**
Showcasing regional ecological and organic seed trials online	**Seed producers, retailers, and organic inspectors identified a lack of organic seed trials as impeding access to knowledge on crop characteristics. Many agencies (BFICSS, Organic Alberta, and others) are responding by developing organic trial projects and creating online access to the trial data. It would also be helpful to create opportunities for growers to exchange with each other about the trials they conduct. This would help synergy among farmers, and between farmers and seed growers. It could also serve as a platform to showcase new regionally adapted seed varieties.**

APPENDIX 1 VEGETABLE SEED MARKET ESTIMATE

BC ecological and organic vegetable seed market

Crop	Total organic and ecological acres	Cost of Seed per Acre	Market estimate
Artichokes	3.87	585	$2,266.87
Asparagus	0.31	207	$64.17
Beets	18.60	865.15	$16,091.72
Broccoli	156.55	2542.72	$398,061.19
Cabbage	34.10	596.4	$20,337.16
Carrots	105.71	1099.46	$116,223.44
Cauliflower	3.10	757.04	$2,346.81
Chard	6.20	310.96	$1,927.94
Garlic	79.67	13,500	$1,075,540.60
Green beans	1,320.62	578.96	$764,588.81
Ground crops	120.78	764.39	$92,319.59
Kale	10.85	958.3	$10,397.51
Lettuce	9.30	149.93	$1,394.34
Onions	26.66	1698	$45,268.49
Peppers	2.11	997.69	$2,103.12
Potatoes	1,521.72	1610	$2,449,972.05
Pumpkin	62.62	203.03	$12,713.69
Spinach	6.20	198.12	$1,228.34
Squash	75.89	485.65	$36,854.86
Tomatoes	5.61	619.29	$3,474.82
Tomatoes/Peppers	6.20	808.45	$5,012.37
Vegetables	1,835.16	764.39	$1,402,779.09
Fruit and vegetables	1,575.65	764.39	$1,204,408.08
Greenhouse Vegetables	158.97	764.39	$121,513.05
Total	7,146.45		$7,786,888.12

* Vegetable, Fruit and Vegetable and Greenhouse Vegetable are calculated via the average cost per acres of all vegetable kinds

** Tomato/peppers categories calculated with average cost per acres of both tomatoes and peppers

*** Ground crops include most vegetables, melons and berries it is calculated average cost per acres of all vegetable kinds

Prairies ecological and organic vegetable seed markets

Crop	Total organic and ecological acres	Cost of Seed per Acre	Market estimate
Beets	13.95	$865.15	$12,068.79
Beans	80.60	$578.96	$46,663.98
Cabbage	6.20	$596.40	$3,697.66
Fresh peas	387.50	$633.60	$245,518.99
Garlic	3.10	$13,500.00	$41,849.83
Leeks	0.31	$1,607.85	$498.43
Lettuce	12.40	$149.93	$1,859.12
Onions	47.27	$1,698.00	$80,272.62
Potatoes (per pound)	689.69	$1,610.00	$1,110,393.13
Radish	85.25	$1,006.20	$85,778.20
Squash	3.10	$485.65	$1,505.52
Sweet corn	403.00	$392.64	$158,233.27
Fruit and vegetables	155.50	764.39	$118,864.77
Total	2,350.08		$2,260,511.59

Ontario ecological and organic vegetable seed market

Crop	Total organic and ecological acres	Cost of Seed per Acre	Market estimate
Asparagus	172.61	207	$35,729.71
Beets	4.93	865.15	$4,264.31
Cabbage	41.91	596.4	$24,996.21
Carrots	40.98	1099.46	$45,057.89
Garlic (lbs)	47.96	13500	$647,416.85
Kale	1.92	958.3	$1,841.85
Leeks	2.79	1607.85	$4,485.88
Lettuce	2.14	149.93	$320.70
Onions	25.42	1698	$43,162.98
Peppers	4.87	997.69	$4,855.74
Potatoes (per lbs)	66.25	1610	$106,657.23
Squash	113.03	485.65	$54,891.18
Sweet corn	818.40	392.64	$321,335.26
Tomatoes	522.87	619.21	$323,769.34
Turnips	3.10	240.24	$744.74
Vegetable seed	0.93	764.39	$710.88
Vegetables	6,344.99	764.39	$4,850,048.45
Fruit and vegetables	20.15	764.39	$15,402.40
Total	8,235.24		$6,485,691.59

Quebec ecological and organic vegetable seed market

Crop	Total organic and ecological acres	Cost of Seed per Acre	Market estimate
Asparagus	37.76	$207.00	$7,817.35
Bean	33.25	$578.96	$19,247.77
Beets	19.92	$865.15	$17,230.86
Brocoli	129.23	$2,542.72	$328,591.06
Cabbage	200.77	$596.40	$119,742.07
Carott	298.06	$1,099.46	$327,704.79
Cucumber (field)	2.07	$532.76	$1,101.89
Cucumber (greenhouse)	1.23	$532.76	$652.97
Garlic (lbs)	255.85	$13,500.00	$3,454,000.16
Jerusalem artichocke (lbs)	241.53	$809.00	$195,395.52
Letuce (all kind)	112.38	$149.93	$16,848.48
Onion	25.66	$1,698.00	$43,573.72
Pepper (field)	20.84	$997.69	$20,787.71
Pepper (Greenhouse)	0.54	$997.69	$534.98
Potato (lbs)	380.87	$1,610.00	$613,195.72
Seeds - various fruit and vegetable	8.12	764.39	$6,206.73
Squash (all kind)	102.72	$485.65	$49,888.09
Sweet corn	178.71	$392.64	$70,169.99
Tomatoes (field)	82.73	$619.21	$51,227.58
Tomatoes (greenhouse)	32.63	$619.21	$20,206.43
Various field vegetable	3,024.87	764.39	$2,312,183.26
Various greenhouse vegetable	47.49	764.39	$36,303.53
Total	5,237.23		7,712,610.65

Atlantic Provinces ecological and organic vegetable seed market

Crop	Total organic and ecological acres	Cost of Seed per Acre	Market estimate
Artichokes	1.55	$585.00	$906.75
Asparagus	0.62	$207.00	$128.34
Beets	3.25	$865.15	$2,816.06
Beans	0.62	$578.96	$358.95
Broccoli	0.37	$2,542.72	$945.89
Cabbage	12.31	$596.40	$7,339.86
Carrots	94.52	$1,099.46	$103,918.96
Cucumber	0.06	$532.76	$33.03
Garlic	7.75	$13,500.00	$104,624.57
Jerusalem artichokes	0.31	$809.00	$250.79
Leeks	1.98	$1,607.85	$3,189.95
Lettuce	13.56	$149.93	$2,032.81
Onions	2.23	$1,698.00	$3,789.92
Parsnips	0.77	$490.68	$380.28
Peppers	0.06	$997.69	$61.86
Potatoes	2,041.65	$1,610.00	$3,287,059.14
Pumpkin	1.52	$203.03	$308.40
Squash	3.91	$485.65	$1,896.95
Tomatoes	7.71	$619.20	$4,773.53
Turnips	24.80	$240.24	$5,957.93
Greenhouse Vegetables	0.10	$764.39	$73.46
Vegetables	646.16	$764.39	$493,920.58
Total	2,865.82		$4,024,767.99

APPENDIX 2 FIELD CROP SEED MARKET ESTIMATE

BC ecological and organic field crop seed market

Crop	Total acres (organic & ecological)	Cost of Seed per Acre	Total market value	Market value purchased seeds
Barley	7,668.40	$13.00	$99,689.23	$39,875.69
Buckwheat	96.20	$29.00	$2,789.80	$1,115.92
Corn	2,542.20	$90.73	$230,653.63	$92,261.45
Flax	1,159.86	$20.83	$24,159.85	$9,663.94
Grains	2,494.44	$35.09	$87,529.76	$35,011.91
Kamut	20.54	$91.00	$1,869.14	$747.65
Lentils	39.00	$38.50	$1,501.50	$600.60
Oats	3,790.77	$13.88	$52,615.86	$21,046.34
Oats/alfalfa	603.20	$27.52	$16,600.04	$6,640.02
Oats/peas	561.60	$23.81	$13,371.68	$5,348.67
Peas	605.80	$33.75	$20,445.72	$8,178.29
Rye	999.02	$12.62	$12,607.66	$5,043.07
Spelt	1,042.60	$91.65	$95,554.14	$38,221.66
Sunflowers	325.00	$17.50	$5,687.49	$2,275.00
Triticale	15.60	$13.39	$208.88	$83.55
Wheat/durum	4,227.59	$22.00	$93,007.06	$37,202.82
Total	7,146.45		$758,291.43	$303,316.57

Alberta ecological and organic field crop seed market

Crop	Total acres (organic & ecological)	Cost of Seed per Acre	Total market value	Market value purchased seeds
Barley	42,685.17	$13.00	$554,907.26	$221,962.91
Beans	509.60	$81.20	$41,379.46	$16,551.78
Canola	2,938.00	$25.00	$73,449.89	$29,379.95
Corn	2,041.00	$90.73	$185,179.64	$74,071.86
Flax	4,378.39	$20.83	$91,201.93	$36,480.77
Grains	13.00	$35.09	$456.17	$182.47
Hemp	9,872.18	$50.00	$493,609.24	$493,609.24
Kamut	988.00	$91.00	$89,907.86	$35,963.14
Lentils	1,170.00	$38.50	$45,044.93	$18,017.97
Mixed grain	301.96	$35.09	$10,595.86	$4,238.34
Oats	49,865.38	$13.88	$692,131.41	$276,852.56
Peas	17,573.35	$33.75	$593,100.46	$237,240.18
Rye	3,777.79	$12.62	$47,675.76	$19,070.30
Spelt	738.66	$91.65	$67,698.08	$27,079.23
Triticale	507.00	$13.39	$6,788.72	$2,715.49
Wheat/durum	54,671.03	$22.00	$1,202,762.57	$481,105.03
Total	192,030.50		$4,195,889.24	$1,974,521.24

Discrepancies between field crop chapter and the table above are due to the adjustment made to the hemp crop market (seed saving is prohibited for hemp).

Saskatchewan ecological and organic field crop seed market

Crop	Total acres (organic & ecological)	Cost of Seed per Acre	Total market value	Market value purchased seeds
Amaranth	257.40	$100.00	$25,739.96	$10,295.98
Barley	132,940.51	$13.00	$1,728,226.67	$691,290.67
Beans	832.00	$81.20	$67,558.30	$27,023.32
Buckwheat	6,619.59	$29.00	$191,968.10	$76,787.24
Canola	1,279.20	$25.00	$31,979.95	$12,791.98
Cereals	8,719.06	$35.09	$305,951.83	$122,380.73
Corn	390.00	$90.73	$35,384.65	$14,153.86
Flax	146,104.49	$20.83	$3,043,356.46	$1,217,342.58
Grains	10,303.78	$35.09	$361,559.78	$144,623.91
Hemp	12,851.75	$50.00	$642,587.71	$642,587.71
Kamut	2,818.40	$91.00	$256,474.00	$102,589.60
Lentils	84,076.07	$38.50	$3,236,928.71	$1,294,771.48
Millet	231.40	$25.50	$5,900.69	$2,360.28
Mixed grain	404.76	$35.09	$14,202.96	$5,681.18
Mustard	9,669.39	$19.00	$183,718.32	$73,487.33
Oats	230,120.98	$13.88	$3,194,079.19	$1,277,631.68
Oilseeds	197.60	$36.19	$7,151.13	$2,860.45
Peas	67,830.70	$33.75	$2,289,286.04	$915,714.42
Prairie carnation	52.00	n/a	$0.00	$0.00
Radish	71.50	$12.00	$858.00	$343.20
Radish seed	195.00	$12.00	$2,340.00	$936.00
Rye	48,718.73	$12.62	$614,830.34	$245,932.14
soybeans	809.52	$54.88	$44,426.24	$17,770.49
Spelt	925.60	$91.65	$84,831.11	$33,932.44
Sunflowers	863.20	$17.50	$15,105.98	$6,042.39
Triticale	1,541.80	$13.39	$20,644.67	$8,257.87
Wheat/durum	408,869.82	$22.00	$8,995,135.98	$3,598,054.39
Total	1,177,694.22		$25,400,226.76	$10,545,643.33

Discrepancies between field crop chapter and the table above are due to the adjustment made to the hemp crop market (seed saving is prohibited for hemp).

Manitoba ecological and organic field crop seed market

Crop	Total acres (organic & ecological)	Cost of Seed per Acre	Total market value	Market value purchased seeds
Amaranth	5.20	$100.00	$520.00	$208.00
Barley	10,902.77	$13.00	$141,735.97	$56,694.39
Buckwheat	873.55	$29.00	$25,332.85	$10,133.14
Camelina	403.00	$13.75	$5,541.24	$2,216.50
Canary Seed	546.00	$12.95	$7,070.69	$2,828.28
Corn	228.83	$90.73	$20,761.35	$8,304.54
Flax	13,530.48	$20.83	$281,839.93	$112,735.97
Hemp	141.34	$50.00	$7,067.20	$7,067.20
Lentils	395.20	$38.50	$15,215.18	$6,086.07
Millet	848.06	$25.50	$21,625.64	$8,650.26
Mixed grain	5,306.83	$35.09	$186,216.56	$74,486.62
Mustard	910.00	$19.00	$17,289.97	$6,915.99
Oats	18,814.24	$13.88	$261,141.70	$104,456.68
Peas	4,002.61	$33.75	$135,087.98	$54,035.19
Rye	10,889.92	$12.62	$137,430.76	$54,972.30
soybeans	2,248.66	$54.88	$123,406.21	$49,362.49
Spelt	486.20	$91.65	$44,560.16	$17,824.06
Wheat/durum	26,604.10	$22.00	$585,290.20	$234,116.08
Total	97,136.98		$2,017,133.60	$811,093.76

Discrepancies between field crop chapter and the table above are due to the adjustment made to the hemp crop market (seed saving is prohibited for hemp).

Ontario ecological and organic field crop seed market

Crop	Total acres (organic & ecological)	Cost of Seed per Acre	Total market value	Market value purchased seeds
Barley	12,144.24	$13.00	$157,875.16	$63,150.07
Beans	1,374.89	$81.20	$111,641.25	$44,656.50
Brassica	12,011.98	n/a		
Buckwheat	7,740.66	$29.00	$224,479.03	$89,791.61
Canola	179.89	$25.00	$4,497.34	$1,798.94
Cereals	213.17	$35.09	$7,480.26	$2,992.11
Corn	36,900.29	$90.73	$3,347,963.05	$1,339,185.22
Flax	506.97	$20.83	$10,560.25	$4,224.10
Lentils	2.60	$38.50	$100.10	$40.04
Millet	187.23	$25.50	$4,774.26	$1,909.70
Mixed grain	7,887.69	$35.09	$276,778.90	$110,711.56
Oats	14,716.06	$13.88	$204,258.85	$81,703.54
Peas	27,739.41	$33.75	$936,205.06	$374,482.02
Rye	5,883.06	$12.62	$74,244.25	$29,697.70
soybeans	62,860.16	$54.88	$3,449,765.31	$1,379,906.12
Spelt	11,031.78	$91.65	$1,011,062.91	$404,425.16
Sunflowers	636.97	$17.50	$11,147.03	$4,458.81
Triticale	769.70	$13.39	$10,306.32	$4,122.53
Wheat/durum	15,368.78	$22.00	$338,113.25	$135,245.30
Total	218,155.54		$10,181,252.59	$4,072,501.03

Quebec ecological and organic field crop seed market

Crop	Total acres (organic & ecological)	Cost of Seed per Acre	Total market value	Market value purchased seeds
Barley	5,779.82	$13.00	$75,137.60	$30,055.04
Buckwheat	10,039.15	$29.00	$291,135.48	$116,454.19
Corn	26,551.74	$90.73	$2,409,039.25	$963,615.70
Flax	256.99	$20.83	$5,353.09	$2,141.23
Hemp	1,762.62	$50.00	$88,131.23	$88,131.23
Mixed grain	26,414.12	$35.09	$926,871.50	$370,748.60
Oats	12,713.38	$13.88	$176,461.77	$70,584.71
Rye	2,162.24	$12.62	$27,287.51	$10,915.00
soybeans	44,234.97	$54.88	$2,427,615.31	$971,046.12
Spelt	4,318.51	$91.65	$395,791.51	$158,316.60
Sunflowers	525.86	$17.50	$9,202.62	$3,681.05
Triticale	146.23	$13.39	$1,957.98	$783.19
Wheat/durum	14,583.75	$22.00	$320,842.54	$128,337.01
Total	149,489.40		$7,154,827.39	$2,914,809.70

Discrepancies between field crop chapter and the table above are due to the adjustment made to the hemp crop market (seed saving is prohibited for hemp).

Atlantic Provinces ecological and organic field crop seed market

Crop	Total acres (organic & ecological)	Cost of Seed per Acre	Total market value	Market value purchased seeds
Barley	1,385.15	$13.00	$18,006.92	$7,045.37
Beans	0.13	$81.20	$10.56	$4.22
Buckwheat	638.56	$29.00	$18,518.21	$7,245.48
Canola	522.60	$25.00	$13,064.98	$5,111.79
Corn	1.04	$90.73	$94.36	$37.74
Grains	78.00	$35.09	$2,737.02	$1,070.88
Millet	10.35	$25.50	$263.87	$105.55
Oats	1,456.02	$13.88	$20,209.61	$7,969.02
Peas	273.23	$33.75	$9,221.63	$3,608.88
Rye	328.90	$12.62	$4,150.71	$1,624.00
soybeans	5,152.76	$54.88	$282,783.27	$110,391.83
Wheat/durum	3,401.92	$22.00	$74,842.20	$29,336.42
Total	13,248.66		$443,903.35	$173,551.18

APPENDIX 3 ORGANIC INSPECTORS SURVEY

The *Canada Organic Trade Association,* in collaboration with *The Bauta Family Initiative on Canadian Seed Security*, is conducting research on the Canadian organic and ecological seed market.

Field inspectors, with their unique position in the organic certification system, have a broad perspective and understanding of the trends and issues concerning the Canadian organic and ecological seed market. This survey aims to collect inspectors' observations and intrinsic knowledge of the field on most common derogations for organic seeds.

Your participation is completely voluntary and anonymous. Your answers will be based on your observations and personal experience in the field. The results will serve as guidelines to further our research on the commercial availability of organic seed varieties.

The survey has 12 questions and will take 10 minutes to complete.

1. Over the past two years, in which provinces have you conducted field inspections? Choose as many as applicable.

- ☐ British Columbia
- ☐ Alberta
- ☐ Saskatchewan
- ☐ Manitoba
- ☐ Ontario
- ☐ Québec
- ☐ New Brunswick
- ☐ Nova Scotia
- ☐ Prince Edward Island
- ☐ Newfoundland
- ☐ Yukon

2. How long have you been an organic inspector?

- ☐ Open answer

3. How many operations do you inspect in average per year?

- ☐ Open answer

- For the questions 4 through 11, please answer to the best of your knowledge -

4. To the best of your knowledge, which were the five most common derogations for **vegetable** seed crops for the past two years:

Crop varieties	What percentage of the farmers growing this crop request a derogation? (Estimation)
1st most common	
2nd most common	
3rd most common	
4th most common	
5th most common	

5. In your experience, please indicate the two greatest challenges that farmers cite when requesting derogation for vegetable seed crops:

- ☐ Specific varieties not available
- ☐ Insufficient quantity of seeds available
- ☐ Varietal integrity
- ☐ Price is too high
- ☐ Weed contamination
- ☐ Low germination rate
- ☐ Possible GMO contamination
- ☐ Other – please specify

6. To the best of your knowledge, for the past two years, the demand for derogations for organic **vegetable** seed crops has been:

- ☐ Increasing
- ☐ Maintaining
- ☐ Decreasing

- For the questions 4 through 11, please answer to the best of your knowledge -

7. To the best of your knowledge, which were the five most common derogations for **field crops** for the past two years:

Crop varieties	What percentage of the farmers growing this crop request a derogation? (Estimation)
1st most common	
2nd most common	
3rd most common	
4th most common	
5th most common	

8. In your experience, please indicate the two greatest challenges that farmers cite when requesting derogation for **field crops**:

- ☐ Specific varieties not available
- ☐ Insufficient quantity of seeds available
- ☐ Varietal integrity
- ☐ Price is too high
- ☐ Weed contamination
- ☐ Low germination rate
- ☐ Possible GMO contamination
- ☐ Other – please specify

9. To the best of your knowledge, for the past two years, the demand for derogations for organic **field crops** has been

- ☐ Increasing
- ☐ Maintaining
- ☐ Decreasing

10. Over the past two years, did you inspect farms that used organic pedigreed seed varieties (seeds produced in accordance with both the Canadian organic standards and CSGA requirements)?

    ☐ Yes

    ☐ No

    If you answered yes, could you please list the most common organic pedigreed seed you recall? List up to three:

    ☐ Open answer

11. Have you encountered a situation where derogation was requested, but denied?

    ☐ Yes

    ☐ No

    If you answered yes, do you know the reason for the denial? Please recorded it here:

    ☐ Open answer

12. The focus of this research is on the past two years, but if you have noticed other longer trends or if you have any other insight to offer on this issue, please feel free to share it here:

    ☐ Open answer

APPENDIX 4 COMPILED COMMENTS FROM SURVEY RESPONDENTS

The focus of this research is on the past two years, but if you have noticed other longer trends or if you have any other insight to offer on this issue, please feel free to share it here:

If these surveys will be done in the future, give us a heads up on Varietal concerns to provide notes for repeaters. Also, some derogation is a one per year situation and none in some areas.

A common statement from organic growers is that the organic seed was of poor quality, i.e. poor germination, contaminated with weed seed, leading edge genetics are not used or varietal purity is suspect. Very few of the growers, when I asked more questions, had done actual field trials to verify this, they just assumed from anecdotal evidence that their assumptions were justified, and requested derogation or did paper seed searches to show compliance to the COS requirements.

As long as derogation will be made available to farmers, they will use it the more they can. Price is a matter, and quality of seeds also.

Because I have only inspected Organic Processors I have not had any on farm direct contact so my observations are based on information gained through the processors that I have dealt with.

Commercial markets for many organic seed varieties do not seem to exist. The only way for such a market to develop is to stop allowing seed rule exemptions.

For potato seed, most production of potatoes is for table stock only, very few grow their own seed. Risk of high virus levels and possible blight spores is too high to venture into seed production, and buyers may not buy if available.

Generally, farmers document seed searches, and then go ahead and plant the seed they want, without contacting the CB to determine if the seed input is compliant, which may result in compliance issues after the seed has been planted. Producers do not take this issue very seriously. There is a lack of knowledge or maybe better terminology there is a selective understanding of the COS, so that producers do the minimum to get by under the organic standards they choose to operate under. The seed industry is not interested in producing seed organically as the pedigree seed industry has weed contamination standards that are difficult to meet, and the volumes of seed demand is very small when compared to the conventional seed business, and lastly there is the problem of segregation of seed if the company producing the seed is in conventional and organic production, I would argue it is not possible to segregate unless there is dedicated equipment in place for both systems. There really is a shortage of organically produced, pedigree seed available. Common seed is available, but often does not have good standards in place for weed contamination, or disease control, or seed quality etc.

I am finding that the certification bodies and file review staff do not give any critical assessment when deciding on derogation. The responsibility of assessment is placed on inspectors with insufficient instruction as to what constitutes a valid reason. I have seen farmers list their local Cargill elevator, which does zero organic business as not having organic seed. Did they honestly think they would ever find, or did they list sources that they knew would not have any organic seed? I think the assessment needs to occur at the certification level the same way input assessment does.

I had a break in inspecting and have found far more organic supply and use of organic seed in the last year compared to 3 years previous.

In QC, farmers are not required to request derogations anymore (they used to be); they are required to demonstrate their efforts to the inspector.

It feels like many organic farmers are being forced to use inferior seed because of the organic rule. Sorry I couldn't be more help.

Some producers really look hard for organic seed, others hardly at all, they write down three sources that said no, and the CBs accept that...I think CBs should increase the expectation of organic seed.

Some producers will go out of their way to locate organic seed others will go with the most convenient supply and easily produce a search document of at least three seed dealers that indicated that organic seed was not available for the variety in question.

The cost of seed is also a big factor in the farmer deciding to purchase conventional seed. Sometimes the company purchasing the grain asks the farmer to grow a specific type of seed e.g. a variety of wheat that has a higher gluten or protein.

The org. seeds are most of the time not available if order late. Sometimes, the producer wait until late spring to order so the org. seeds are back order and then, they buy non-treated seeds so it's cheaper. Also, in some area, the supplier has in stock only a few org. seeds mostly for grains. No forage grains are available in organic in many areas in Quebec and Maritimes .So it's goanna be ridiculous for producer to ask derogations all the time. The volume available as organic, since I started in 2006, did not increase a lot! I know 2 producers who grows org. seeds (wheat and oat) conforming to the COR and CSGA, but because they lives to far, no suppliers wants really buy those seeds (too expensive, and/or no storage for segregation, etc.) so they sold as conventional. Sadness...

The volume of seed for hay fields doesn't seem to be available.

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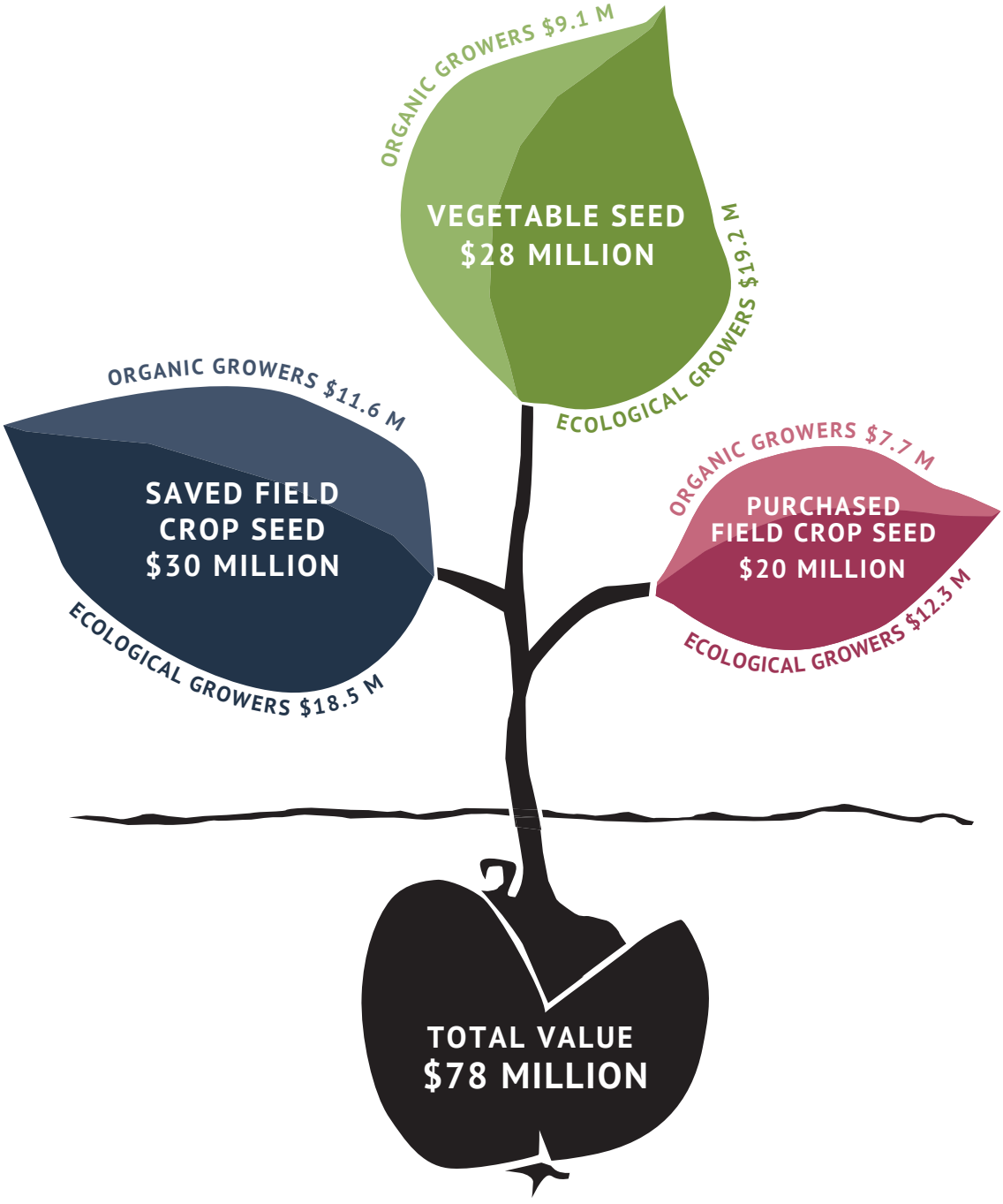

Canada Organic trade association
Association pour le commerce des produits biologiques

THE BAUTA FAMILY INITIATIVE ON CANADIAN SEED SECURITY