

SUSTAINABABLE SOURCING ACTIVITIES FOR AGRICULTURAL PRODUCTS IN CANADA

KEY FEATURES, COMMONALITIES AND DIFFERENCES

FOR:	Agricultural Research and Extension Council of Alberta
BY:	Nathan Pelletier Global Ecologic Environmental Consulting and Management Services Ltd.
START DATE:	January, 2016
DELIVERY DATE:	March 31, 2016
Permanent address:	9710 Coldstream Creek Road Coldstream, British Columbia, Canada tel 250 549 2624 email nathanpelletier@globalecologic.com

www.globalecologic.com



Liability Statement

This report was developed based on information and methods considered to be credible. Users of the data and information contained herein are solely responsible. Global Ecologic Ltd. is not liable for any loss or damage arising from use of the information contained in this report.

Funding and Disclaimer

The report was prepared as information for the Agricultural Research and Extension Council of Alberta (ARECA). The views and opinions expressed in this report are not necessarily those of ARECA.

Suggested Citation Format

Pelletier, Nathan. 2016. Sustainable Sourcing Programs in Canada. *Produced for the* Agricultural Research and Extension Council of Alberta *by* Global Ecologic Environmental Consulting and Management Services, Canada.

About Nathan Pelletier and Global Ecologic

Nathan Pelletier (Global Ecologic Environmental Consulting and Management Services) works closely with clients to build an understanding of supply chain environmental and social sustainability performance and mitigation opportunities. These include application of environmental and social life cycle assessment, environmental footprinting, supply-chain greenhouse gas accounting and other modeling approaches, as well as the social license/market access dimensions of sustainability management. He is dedicated to delivering high-quality, cost-effective consulting services to meet the demands of citizens, firms and organizations committed to furthering sustainability objectives. For more information, see Appendix B.



Executive Summary

The marketplace for agricultural products is increasingly influenced by activities aimed at measuring and communicating information with respect to the sustainability implications of both specific food products and production practices. These initiatives generally consider the entire value chain but focus, in particular, on the farm-level production of agricultural commodities, where the majority of resource use and potential impacts tend to be concentrated. Initiatives which fall under the broad category of "responsible" or "sustainable" sourcing have proliferated in recent years.

In Canada, several industry-led, multi-stakeholder initiatives to define the criteria, indicators and protocols to support sustainable sourcing for particular commodity groups are currently under development. In addition to these, numerous companies host their own, in-house sustainable sourcing programs, and a variety of international initiatives which could potentially be applied to sustainable sourcing in Canada also exist.

This study undertook to screen sustainable sourcing initiatives for their potential applicability for Alberta farmers (current or future) in order to identify and evaluate a subset of the most relevant among these schemes. This subset was subjected to more detailed analysis in order to characterize key features, commonalities and differences among the schemes.

The screening exercise and subsequent analysis provided strong indication that the scale of actual implementation of sustainable sourcing activities that are of relevance for major agricultural commodities in Alberta is currently very limited. With few exceptions, discussions with representatives of industry associations, companies, and other stakeholders suggested that very few farmers are presently being asked by value chain partners to participate in and demonstrate compliance with the requirements of sustainable sourcing activities. Notable exceptions include potato growers participating in the Potato Sustainability Initiative, canola growers participating in ADM's Sustainable Growers Program, and livestock operators subject to animal welfare audits by processors, food service providers, retailers and/or restaurants. The current lack of implementation of sustainable sourcing activities specific to the environmental performance of most major Alberta agricultural commodities likely reflects, in part, the tactical approach of many businesses, who tend to focus their immediate efforts on more controversial products such as seafood, palm oil, and Brazilian soy, or on issues raised by their customers such as animal welfare and anti-biotic use.

One notable challenge for the implementation of sustainable sourcing requirements in Canada is that most bulk commodities are commingled and marketed as "Canadian." Traceability to specific farms or even provinces is very difficult in these circumstances. The use of mass balance approaches by processors, who operate at an important nexus point between producers and their downstream customers and who are hence well-positioned to mediate the sustainable sourcing requirements of



different customers, provides one option for communicating the degree of implementation of required practices along the supply chain. The challenge of incentivizing producers and discouraging free-riding, however, remains.

Beyond general principles regarding promoting more sustainable agricultural practices, the evaluated schemes were found to be quite heterogeneous in both breadth and depth. Some of the more mature schemes – for example, Unilever's Sustainable Agriculture Code and the International Sustainability and Carbon Certification system – provide detailed requirements and supporting guidance. Many of the initiatives, however, only describe general objectives and requirements. In the case of the latter schemes, implementation at the farm level will likely be challenging.

The most prevalent type of sustainable sourcing scheme is the "compliance checklist" approach, whereby farmers are required to demonstrate compliance with a set of required outcomes or best practices. Prescriptive, quantitative performance targets are not commonly employed, although some schemes do ask for goal setting with respect to reducing, for example, greenhouse gas emissions, waste, and water use. Other kinds of schemes such as calculators and certification programs do exist but are less common. Third-party tools such as calculators developed through multi-stakeholder initiatives may, however, be used by some companies in support of specific sustainable sourcing activities. For example, General Mills is currently using the Canadian Fieldprint Calculator for pilot projects in Manitoba and Saskatchewan. One common thread tying most the schemes together is the emphasis on demonstration of continuous improvement over time.

A large number of different criteria and indicators for various aspects of environmental sustainability are employed by the schemes considered. Animal welfare and socio-economic criteria are also common, although these were not the subject of detailed analysis in this study. There is, however, a smaller subset of criteria that is common across most of the schemes. These are: Water Management; Energy Use/Efficiency; Climate; Soil Management; Biodiversity Conservation/Enhancement; Waste Management; Crop Protection Management; and Nutrient Management. At the more specific level of indicators used to assess performance for these criteria, the sets employed by each scheme typically vary. Also variable is the degree of specificity and guidance to support demonstrating compliance with the criteria and indicators. Moreover, some schemes refer to criteria only, without describing supporting indicators.

Requirements and practice related to verification/audit also differ considerably. A small number of schemes provide a detailed description of verification/audit requirements. Others state simply that suppliers must demonstrate compliance with their requirements, including for the upstream supply chain, and that audit/verification may be undertaken. For some schemes, no information referring to verification/audit activities was identified.

Taken together, these observations suggest considerable scope for maturation for most of the initiatives evaluated, as well as the clear desirability of harmonization among initiatives. In general, the feasibility



and efficacy of sustainable sourcing will be strongly influenced by the extent to which farmers are enabled to participate. This requires clarity and consistency in requirements, verification/audit mechanisms, and avoidance of duplication and overburden resulting from farmers having to grapple with multiple, heterogeneous schemes.



Contents

Executive Summary
List of Figures
List of Tables9
Introduction
Methods
Identifying Applicable Sustainable Sourcing Schemes12
Characterizing Commonalities and Difference between the Selected Sustainable Sourcing Schemes . 14
Characterization by type14
Characterization of criteria and indicators employed14
Characterization of verification/audit requirements14
Summary of commonalities and differences14
Evaluation of the accessibility of the selected sustainable sourcing schemes
Results and Discussion18
Summary of the Sustainable Sourcing Schemes Considered20
Multi-Stakeholder Initiatives21
Private Company Initiatives37
Characterization of Commonalities and Differences between the Selected Sustainable Sourcing Schemes
Characterization by Scheme Type61
Criteria and Indicators Employed by the Sustainable Sourcing Schemes
Audit/Verification Requirements of the Sustainable Sourcing Schemes
Assessment results for the "accessibility" of the selected sustainable sourcing schemes70
Summary of Some Key Commonalities and Differences among the Selected Schemes
Conclusions
Appendix A. Detailed Evaluation Results for the Accessibility of the Program/Activity78
Canadian Fieldprint Calculator
Sustainable Agriculture Initiative Farm Sustainability Assessment 2.0
ISCC/ISCC Plus80



	Potato Sustainability Initiative	81
	Nestle Supplier Code and Responsible Sourcing Guideline	82
	Unilever Sustainable Agriculture Code	83
	Molson Coors Supplier Code and Agricultural Brewing Ingredients Policy	84
	Kelloggs Supplier Code	85
	Sysco Supplier Code and Related Measures	86
	Walmart Sustainability Index and The Sustainability Consortium	87
	Pepsico Supplier Code and Sustainable Farming Initiative	88
A	ppendix B. About Nathan Pelletier and Global Ecologic	90



List of Figures

Figure 1. "Accessibility" scores (ranked from highest to lowest) for a subset of each of the reviewed	
sustainable sourcing schemes	71



List of Tables

Table 1. Matrix of criteria applied for evaluating the selected sustainable sourcing schemes for	
accessibility.	16
Table 2. Sustainability schemes selected for detailed assessment.	20
Table 3. Characterization of schemes by type	62
Table 4. Criteria employed by the selected schemes	65
Table 5. Characterization of scheme audit/verification requirements	68
Table 6. Summary of key commonalities and differences among the selected schemes	74
Table 7. Sustainable sourcing programs that refer to priority Alberta commodities	76





Introduction

Sustainability, and sustainable food systems in particular, are topics of increasing importance in society at large. This growing attention to the role of food production as a key contributor to sustainability outcomes reflects the very large contribution made by food systems in aggregate to our collective resource demands, as well as a host of both environmental impacts and socio-economic costs and benefits that accrue across ecosystems and stakeholder groups. Understanding, measuring, and managing the sustainability of particular food products and production technologies is therefore an area of intense research and implementation activities.

Of central importance to the field of food system sustainability measurement and management is life cycle thinking – which is, perhaps, the most importance new paradigm in the art and practice of effective management. Life cycle thinking requires that managers seek to understand and influence activities and interactions across the entire value chain in order to promote improved sustainability outcomes. Importantly, this approach to sustainability management facilitates identification of potential trade-offs that may occur as a result of management decisions – whether at different stages along the value chain or between various sustainability objectives. Essential to effective life cycle-based sustainability management is engagement and collaboration with value chain partners, whose cooperation is essential in leveraging improvements.

Beginning in the early 2000's large food companies such as Unilever and Danone began to convene multi-stakeholder groups in order to develop schemes to support sustainable sourcing by processors, food service providers, restaurants, and other customers of food products. These initiatives reflected a growing recognition among leading companies of increasing societal expectations regarding corporate social responsibility as well as the competitive advantage that would ultimately be conferred to those at the leading edge of sustainability management. Since the majority of emerging research suggested that the largest share of supply chain sustainability impacts for food products tended to be concentrated at the level of raw material production, such schemes encompassed the entire supply chain.

The momentum behind sustainable sourcing activities and programs in the food system was further bolstered by strong signals from European regulators regarding the eventual legislation of corporate social responsibility. Indeed, a variety of initiatives have been undertaken or supported by the European Commission with respect to developing standards to enable a level playing field in food system sustainability initiatives associated with policy developments. These initiatives have underscored that sustainability as the bottom line of business activity has now become a "when" rather than "if" question.

Since these first developments with respect to sustainable sourcing activities in the food supply chain, similar efforts by both multi-stakeholder groups and individual companies have proliferated. At present, food system stakeholders, including farmers, face a bewildering array of actual or emerging



expectations and requirements for participation in food supply chain sustainability programs. These programs, which may include environmental, animal welfare, and socio-economic sustainability criteria, are highly diverse. The sheer number of such programs, as well as considerable inconsistency between them with respect to requirements, indicators, and rigor is clearly inefficient both for farmers and other value chain actors. As a result, harmonization efforts to bring greater consistency and rigor to such efforts have also become quite important. Harmonization efforts are largely being led by industry associations in the food system, in cooperation with a variety of stakeholders including farmers. An important feature of any such initiative is, wherever possible, to build on existing programs and systems that are already in place, and which are familiar to stakeholders.

The Environmental Farm Plan (EFP) program is a whole-farm, self-assessment tool that enables farmers to identity environmental risks associations with their activities, and to develop risk reduction plans. EFP has been operational in Canada since its genesis in Ontario in 1993. All provinces along with the Yukon Territory have since implemented their respective versions of the EFP program. At present, roughly 35% of producers accounting for 50% of the agricultural land base in Canada have completed an EFP. Although EFP programs differ by province in certain respects, there is nonetheless considerable similarity between them. A national-level initiative is currently underway to explore opportunities for harmonization. One key purpose of a harmonized, national EFP is to ensure that provincial/territorial EFPs cover, to the extent possible, the common requirements of various sustainable sourcing programs.

Towards this end, the Agricultural Research and Extension Council of Alberta (ARECA), which manages the Alberta EFP program, has begun to explore the possible role of a modified EFP program in enabling farmers with an EFP to satisfy the environmental component of current or emerging sustainable sourcing programs. As part of this process, ARECA commissioned Global Ecologic Ltd. to undertake a study of sustainable sourcing programs in Canada which may prove relevant for Alberta farmers. Specifically, the study is to evaluate key commonalities and differences between the most relevant of such programs. An envisioned second step of this research is to evaluate the extent to which the EFP currently enables farmers to satisfy the common requirements of these programs, as well as what modifications to the program might be entertained such that the majority share of requirements can be satisfied. The current report describes the rationale, methods and results of the initial phase of this research.



Methods

Identifying Applicable Sustainable Sourcing Schemes

There is a wide variety of programs and activities that are designed for, or may be applied in the context of, sustainable sourcing of agricultural products. These programs may address single or multiple dimensions of sustainability (i.e. environmental, social, economic, animal welfare, food quality and safety, etc.). They may be multi-stakeholder initiatives, industry programs, private company, or government-sponsored activities. They may also be applicable in specific geographies or globally, and for specific food products or for agricultural raw materials in general.

Several reports are available describing and evaluating various among these schemes. These include, for example:

- Sustainability indicators, tools and reporting systems for agri-food products. *Prepared by* Global Ecologic Environmental Consulting and Management Services Ltd. *for* Alberta Agriculture and Rural Development. 2015.
- Sustainability evaluation techniques. *Prepared for* Environmental Stewardship Division, Alberta Agriculture and Rural Development *by* Campbell H and K Koehler-Munroe. 2013.
- Examination of government & non-governmental sustainability requirements for agriculture products. *Prepared for* Agriculture and Agri-Food Canada *by* Waterfall Advisors Group Ltd. 2012
- Evaluation of Agri-food Sustainability Certification Systems. *Prepared by* George Morris Centre *for* Ontario Fruit and Vegetable Growers Association.

Internet searches or perusal of materials available in academic databases further reveal a diversity of additional initiatives.

A first necessary step for this study was to identify which among these schemes may be most relevant/applicable for Canadian farmers in general, and for Alberta farmers more specifically. Following an initial scan of the above resources in order to identify sustainable sourcing schemes of potential relevance, the following criteria were applied in order to arrive at a short-list of schemes to be considered:

- the scheme refers specifically or generally to a priority Alberta agricultural commodity, as determined based on
 - agricultural area devoted to production of the commodity in Alberta (including, for livestock, feed input production), specifically



- wheat
- canola
- tame hay
- barley
- peas
- oats
- livestock (beef, pork, chicken, eggs, milk)
- \circ a specific request by ARECA that the commodity be considered in the study
 - sugar beets
 - potatoes
- apparent relevance of the scheme, as indicated by telephone and email correspondence with representatives of industry associations in order to determine the perceived relevance of particular schemes for each commodity group
- apparent relevance of the scheme as indicated by telephone and email correspondence with scheme owners in order to determine the perceived importance of the scheme for Canadian farmers in general and for Alberta farmers in particular
- apparent scale of implementation of the scheme, as indicated by publically available reports regarding instances of scheme implementation
- in the case of private company schemes, both size and Canadian presence of the company
- in the case of private company schemes, indication by a company representative (in telephone or email correspondence) or in publically available literature published by the company that the scheme is being or may be implemented in Canada generally or in Alberta specifically
- quantity and quality of publicly available information describing the scheme

Efforts were also made to select a cross-section of schemes representing the activities of different food system actors, including processors, retailers, food service providers, and industry groups. In some cases, this meant the inclusion of schemes for which limited information was available, or with limited current attention to Alberta-relevant commodities.

Once a short-list of schemes to be considered was identified, a summary description of each program/activity was developed based on publically available information and additional information obtained via telephone and/or email correspondence with scheme owners or stakeholders.



Characterizing Commonalities and Difference between the Selected Sustainable Sourcing Schemes

Characterization by type

In order to facilitate evaluation of the selected sustainable sourcing schemes, they were first characterized by type. The classifications employed were:

- Calculators (on-line or downloadable tools whose primary purpose is to allow direct calculation of the sustainability performance of agri-food production or products)
- Certification programs (requiring third-party verification of sustainability performance against a publically available standard)
- Checklist compliance programs (sustainable sourcing programs that apply checklists with respect to a subset of sustainability indicators or best practices and require either self or third-party assessment)
- Other

Characterization of criteria and indicators employed

The specific criteria and indicators employed for each program were identified. Where criteria and indicators referring to a common theme were identified, they were assigned under a common heading (for example, indicators related to crop protection product application, handling, management, etc. were assigned under the criteria "crop protection management " (specific details regarding criteria and indicators are provided in the summary description for each sustainable sourcing scheme). Frequency of use of each criterion was also assessed in order to determine the apparent comparative relevance of each.

Characterization of verification/audit requirements

Sustainable sourcing schemes may or may not be supported by verification/audit requirements. Those schemes involving verification/audit were identified.

Summary of commonalities and differences

In order to summarize key commonalities and differences between the shortlisted sustainable sourcing schemes, the schemes were compared in terms of:

- program/activity type
- o operator (i.e. government voluntary, government mandatory, multi-lateral, private)



- stakeholder representation (i.e. stakeholders were involved in development of the scheme)
- single or multi-criteria
- verification/audit requirements
- o emphasis on continuous improvement
- Alberta-relevant sector(s)/commodity group(s) of focus

Evaluation of the accessibility of the selected sustainable sourcing schemes As an additional step to better resolve key commonalities and differences between the selected schemes, a semi-quantitative analysis was undertaken to determine their general accessibility for Alberta farmers. Accessibility refers to the comparative ease with which Alberta farmers might satisfy the requirements of each program/activity.

An assessment matrix was developed employing a variety of criteria for accessibility. Performance was assessed using a "stop-light" system, whereby a program/activity was scored for each sub-criterion based on the extent to which it satisfied the criterion (i.e. red for "does not satisfy the sub-criterion", yellow for "somewhat satisfies the sub-criterion", and green for "satisfies the sub-criterion." A "not applicable" assignment was possible where sub-criteria were not relevant for the assessment of specific schemes. A notes section was also included for each criterion.

Once scores were assigned for all sub-criteria, weighted average scores were subsequently calculated for overall accessibility. Here, weights of 0, 1, and 2 were assigned to red, yellow and green ratings, respectively. The overall score for each program/activity was calculated by dividing the sum of the sub-criteria scores by the total possible score (i.e. number of criteria for which a green rating could have been applied multiplied by two, not including sub-criteria where a "not applicable" rating had been applied). This allowed ranking the schemes based on their scores for accessibility.

ACCESSIBILITY

Evaluation Criteria

The scheme...

- (1) provides clear information as to its purpose and applicability
- (2) provides clear guidance documents in support of its implementation



(3) is accessible to a non-expert audience

(4) requires data that are reasonably accessible

(5) has supporting tools/software or other materials that facilitate its implementation

(6) does not have high implementation costs

(7) has clear verification/audit procedures and requirements

Totals

Weighted Accessibility Score

describes the sub-criteria applied.

Table 1. Matrix of criteria applied for evaluating the selected sustainable sourcing schemes for accessibility.

ACCESSIBILITY
Evaluation Criteria
The scheme
(1) provides clear information as to its purpose and applicability
(2) provides clear guidance documents in support of its implementation
(3) is accessible to a non-expert audience
(4) requires data that are reasonably accessible
(5) has supporting tools/software or other materials that facilitate its implementation
(6) does not have high implementation costs



(7) has clear verification/audit procedures and requirements

Totals

Weighted Accessibility Score



Results and Discussion

According to the International Chamber of Commerce, responsible sourcing refers to "a voluntary commitment by companies to take into account social and environmental considerations when managing their relationships with suppliers." The term "responsible sourcing" is used interchangeably with the term "sustainable sourcing." The literature and web review revealed widespread use of these terms, in particular in the private sector. For example, a Google search for "responsible sourcing" generates over three hundred thousand hits, while a search for "sustainable sourcing" generates close to two hundred thousand hits. In light of the relatively short history of corporate social responsibility reporting and associated initiatives as mainstream business activities, the degree of saturation of these concepts into the corporate lexicon is, indeed, remarkable. This is certainly evinced in the food sector, where few companies that might be classified as large and successful enterprises host websites that are devoid of references to responsible or sustainable sourcing.

That said, the preliminary screening of sustainable sourcing activities for food products that may be of relevance in Alberta (or in Canada more generally), as well as the subsequent, more detailed analysis of a subset of selected schemes suggested that the breadth of attention to sustainable sourcing is not yet matched in depth. A preliminary indication of this general observation was provided via telephone interviews with spokespersons of industry associations representing the various Alberta agricultural commodities that were prioritized for consideration in this analysis. In particular, when queried as to the extent that their respective constituents are currently actively engaged in satisfying the sustainable sourcing requirements of customers, the reply was almost unanimous in consistency – they are not. Besides a few notable exceptions (for example, farmers and processors using ISCC certification to gain access to EU biofuel markets, potato growers communicating their sustainability assessment results to their customers through the Potato Sustainability Initiative's on-line platform, or Unilever's implementation of the Sustainable Agriculture Code via the Greenlights software system) it would appear that sustainable sourcing (at least for the commodity categories of focus for this study) largely remains at the conceptual level in the Canadian agri-food system. For certain other commodities that are outside of the scope of the current analysis, however, - for example fisheries and aquaculture products - sustainable sourcing programs have already been in place and implemented by a crosssection of stakeholders for quite some time. This is similarly true for commodities such as palm oil, cocoa, coffee and soy, as a result of concerns regarding production conditions and impacts for these products elsewhere in the world. Indeed, attention to sustainability issues related to these latter and similar product categories internationally provided much of the original impetus for the development of the sustainable sourcing movement.

Another important exception to this general observation of the current lack of implementation of sustainable sourcing programs in Canada that do apply to some of the Alberta commodities of concern relates to current application of food safety/quality and animal welfare criteria in sourcing activities for livestock products. Certainly, these issues contribute to the much broader suite of criteria that ultimately must be considered in comprehensive sustainability assessments for food products. With



respect to environmental sustainability concerns however, and the subset of commodities here considered, the observation of inactivity generally holds true.

A second indication of the apparent absence of widespread implementation of sustainable sourcing requirements for the commodities considered was provided by some of the companies whose in-house sustainable sourcing programs were considered in this analysis. In general, there seemed to be a reticence among the majority of these companies – whether processors, food service providers, restaurants, or retailers - to discuss their respective sustainable sourcing activities. As part of the research undertaken to evaluate the short-listed schemes, efforts were made to contact the scheme owners by both telephone and email. These attempts (in many cases repeated several times) included a brief overview of the purpose of the current study and an expression of interest in discussing the specific company's current or envisioned sustainable sourcing activities that might be of relevance. A minority share of the scheme owners who were contacted replied to either initial or follow-up queries – despite that all of the schemes described on the company websites do refer either generally or specifically to at least some of the agricultural commodities considered in this analysis.

A smaller subset of the companies that were contacted did agree to discuss their activities. Several interesting insights emerged from these discussions. First was that, for companies with international presence, the sustainable sourcing activities of their operations in the US and/or Europe tend to be more advanced than are those for the Canadian operations. This likely reflects several factors, among them that (1) companies headquartered elsewhere are likely to first develop and trial sustainable sourcing initiatives in their headquarter country; (2) companies based in Europe face a business environment where sustainable sourcing activities achieved widespread implementation earlier than in North America (spurred on both by early adopters such as food industry giants Unilever and Danone as well as by moves by the European Commission and/or specific countries to legislate corporate social responsibility-related activities); and (3) the generally favourable reputation of the Canadian agriculture sector with respect to environmental performance. Several interviewees also suggested that the Canadian branches of their respective companies are waiting to learn from the implementation of the sustainable sourcing activities of the US branches prior to implementation in Canada. More than one company spokesperson - despite the presence of a non-trivial volume of material describing the importance and foci of sustainable sourcing on their company's website - indicated that their company is not, in fact, currently implementing any sustainable sourcing activities. One interviewee representing a major supplier to a large retailer described that the staff responsible for sustainable sourcing for that retailer had been relocated to the company's US headquarters – effectively putting a halt to progress in the retailer's sustainable sourcing activities in Canada.

It should be noted, however, that outside of private company initiatives, a number of important, multistakeholder, industry-level initiatives to support sustainable sourcing activities for specific commodity groups are currently underway in Canada. This includes, for example, the Canadian Round Table on Sustainable Beef, the Canadian Roundtable on Sustainable Crops, and the Dairy Farmers of Canada proAction program. Despite that these initiatives are works in progress (i.e. specific details regarding



indicators and verification/audits protocols are at various stages of development), they will likely be of considerable relevance for both Albertan and Canadian farmers. Certainly, one important motivator behind the emergence of such initiatives is concern regarding the inefficiencies and burdens that may be created by the implementation of numerous, disparate sustainable sourcing requirements by value chain partners. Instead, a key goal for these initiatives is to provide a single, common set of protocols by which sustainability performance may be assessed and communicated for their respective commodity groups.

Despite the seemingly low level of actual sustainable sourcing activities that are currently being implemented for the commodities of concern in Canada, the general sentiment of those interviewed for this study was that implementation of such activities is clearly on the radar. Interviewees from industry associations, private companies, and third party sustainable sourcing service providers were almost unanimous in recognizing both the growing relevance of sustainable sourcing as a market access and social license consideration, as well as the abundance and diversity of emerging schemes.

Summary of the Sustainable Sourcing Schemes Considered

Following the preliminary screening to determine their applicability, eighteen schemes were selected for more detailed analysis (Table 2). These include both multi-stakeholder and private company initiatives. Some of the initiatives, such as the Canadian Roundtable on Sustainable Beef, the Canadian Roundtable on Sustainable Crops, and the Dairy proAction program are currently under development. In these cases, complete details are not yet available regarding specific indicators, metrics, and/or verification/audit requirements. However, they were nonetheless considered sufficiently important activities to merit their inclusion - despite that the scope of analysis that is presently possible is limited.

Table 2. Sustainability schemes selected for detailed assessment.

Schemes Selected for Detailed Assessment
Canadian Fieldprint Calculator
Sustainable Agriculture Initiative Farm Sustainability Assessment Tool 2.0
International Sustainability and Carbon Certification (and ISCC Plus)
Potato Sustainability Initiative
Canadian Round Table on Sustainable Beef
Canadian Round Table on Sustainable Crops
Dairy Sustainability Framework and Dairy proAction
Nestle Supplier Code
Unilever Sustainable Agriculture Initiative
General Mills
Molson-Coors Supplier Code and Agricultural Brewing Ingredients Policy
Loblaw Sourcing with Integrity



Kelloggs Supplier Code	
Sysco	
Costco	
Walmart Sustainability Index and the Sustainability Consortium	
ADM (Sustainable Growers Program - ISCC)	
Pepsico Supplier Code and Sustainable Farming Initiative	

There is considerable heterogeneity in the quality and quantity of publically available information describing the various schemes. In some cases, a substantial amount of detailed information is available regarding the scheme, facilitating in-depth analysis. Preference was given to such schemes in developing the short-list of those to be considered. In other cases, very little publically available information was identified. Where the scheme owner in question is of obvious importance in the Canadian food system, it was decided to anyways include them in the analysis as examples of sustainable sourcing in their business categories (for example, Loblaw and ADM).

The schemes also differ widely in terms of breadth. Some refer to single issue areas only (for example, the animal welfare audits implemented by Costco), whereas many refer to numerous criteria and indicators. The following section provides a detailed description of each of the short-listed schemes and its respective requirements.

Multi-Stakeholder Initiatives

Canadian Fieldprint Calculator

The Canadian Fieldprint Calculator (Serecon 2015) is being developed in parallel to but independently of the US Field to Market initiative. Whereas the US initiative lists among its membership almost 100 organizations, including major processors, retailers, industry associations, NGOs, academic institutions, direct membership in the Canadian initiative is currently much more modest. This initiative is, however, working in association with the Canadian Round Table on Sustainable Crops, which itself has broad membership among stakeholders in the Canadian crop sector. The calculator has been primarily developed by the consulting firm Serecon.

The purpose of the Canadian Fieldprint Calculator is to enable farmers, at the individual farm level, to:

- Calculate and compare sustainability outcomes on their farms to regional averages
- Compare their sustainability outcomes over time
- Compare the sustainability outcomes of alternative scenarios on their farms

The Calculator currently includes metrics for Land Use, Soil Loss, Energy Use and Climate Impact.



Development of the calculator began with a pilot study of several Western Canadian field crops (spring, winter, and durum wheat, canola, oats, peas, flax and lentils). This study provided the initial methods and data basis for developing the calculator. The intention is that the calculator will be further developed such that it will ultimately apply to a broader suite of crops than does the American Field to Market Fieldprint calculator. More indicators may also be developed – for example, for water use and biodiversity.

Depending on the role that the Canadian Fieldprint Calculator eventually plays within the broader suite of sustainability metrics that the Canadian Round Table on Sustainable Crops intends to develop, it may potentially enjoy widespread use among sustainable sourcing programs that apply to field crop production in Alberta. Given that the calculator supports comparing individual farms to regional averages as well as tracking changes in indicator performance over time, it may prove suitable to satisfying the sustainable sourcing requirements of specific customers who require demonstration of continuous improvement.

At present, the Canadian Fieldprint Calculator does not appear to be used in sustainable sourcing programs. A notable exception is the Canadian pilot studies currently being undertaken by General Mills. These include studies of farms producing oats in Manitoba and Saskatchewan (with North American Food Ingredients and Patterson as partners), and also soy farms in Ontario. The former pilot study implies the possibility that use of the Canadian Fieldprint Calculator could potentially be required of Alberta oat producers by General Mills in the future.

Use of the calculator is reasonable straight-forward. The calculator is freely available as a downloadable, Excel-based tool. The tool requires that farmers enter data for their farms and farming activities, which may be specified at the individual field level.

Data required includes:

- farm and field location
- farm equipment details such as name, horsepower or fuel use, use rate (acres/hr)
- soil information
- tillage practices
- wetland drainage
- crop rotations, frequency of rotations and yield
- fertilizer, manure, and pesticide type and application rates
- harvest practices

Sustainable Agriculture Initiative Platform

The Sustainable Agriculture Initiative (SAI) Platform is a food industry initiative to promote sustainable agricultural practices worldwide. It was created in 2002 by Nestle, Unilever and Danone for the purpose of sharing knowledge and best practices for sustainable agriculture at a precompetitive level. Since its creation, membership in the SAI Platform has grown considerably. The Platform now has a membership



of food value chain stakeholders that exceeds 70, including many of the world's largest agri-food processors and retailers.

The Platform defines sustainable agriculture as "the efficient production of safe, high quality agricultural products, in a way that protects and improves the natural environment, the social and economic conditions of farmers, their employees and local communities, and safeguards the health and welfare of all farmed species." Rather than addressing niche markets, the Platform focuses on mainstream agriculture and, hence, the majority of food products globally.

An important focus of the SAI Platform is the development of tools to facilitate sustainable sourcing and the dissemination and mainstreaming of sustainable agricultural practices. The emphasis is not only on measuring sustainability performance in food production, but rather on capacity building and encouraging continuous improvement.

In support of these aims, the SAI Platform activities include:

- developing principles and practices for the sustainable production of arable and vegetable crops, coffee, dairy and fruit (best practices are tested through pilot projects).
- benchmarking principles and practices against the guidelines and recommendations of other food value chain sustainability schemes.
- developing a Sustainability Performance Assessment tool for first or third-party evaluation of agricultural practices.

The Platform currently has five working groups respectively addressing arable and vegetable crops; beef, coffee, dairy, and fruit. In addition, four committees are devoted to cross-cutting agricultural challenges, specifically: biodiversity; farmer and supplier partnerships; farm sustainability assessment; and water.

Of direct relevance for Alberta farmers are SAI's "Principles and Practices for Sustainable Dairy Farming" and "Principles and Practices for the Sustainable Production of Arable and Vegetable Crops." These principles and practices documents lay out areas of foci for which a farmer, in pursuit of continuous improvement with respect to sustainability writ large (i.e. including economic, social and environmental sustainability) can consider and seek to improve their farming system. For environmental sustainability, specifically, the principles and practices refer to:

- soil fertility/soil loss
- water use and quality impacts
- biodiversity
- energy inputs, and associated climate change impacts
- waste



The dairy principles and practices also provide guidance with respect to animal welfare (genetics, health planning and bio-security, and animal husbandry), as well as the broader farming system including feed production.

Of more general relevance across Alberta farming systems with respect to participation in potential sustainable sourcing schemes is the Farm Sustainability Assessment (FSA) 2.0 tool. FSA is a whole-farm, self-assessment tool which farmers and other value chain stakeholders can apply in the interest of benchmarking and monitoring for continuous improvement in the sustainability performance of agricultural activities. It is not commodity-specific, but rather may be used for all crop agricultural production systems and farm sizes. It is intended for use in sustainable sourcing by companies who do not have their own, company-specific codes. When applied more broadly, the tool also supports aggregating farming data geographically, as by commodity and supplier. Among the specific benefits to farmers, the SAI Platform refers to :

- improving performance
- reducing costs (i.e. with respect to communicating practices along the value chain)
- saving resources (by reducing duplication of effort if used as the sole tool for assessment, auditing and verification of farm practices)
- improving market access (i.e. preferential access to companies interested in sustainable sourcing)

The FSA 2.0 tool is compliant with the principles and practices documents produced by the platform, hence use of the latter may be supported by the guidance provided by the former. The tool has also been pilot tested, with results from these pilots informing further refinement of the tool.

Farmers wishing to use the FSA 2.0 tool may either download and complete an Excel-based tool, or input data directly via an on-line platform. Results may be saved and compared over time, and the farmer has the option of sharing the results with customers. The tool has an accompanying user guide.

Consistent with the SAI Platforms focus on sustainability in the broad sense, the FSA 2.0 tool contains general questions about the farming systems, as well as specific questions related to economic, social and environmental sustainability. Each question is supported by a brief guidance section, including recommended practices with respect to the specific question. Subject areas for environmental sustainability refer to:

- Farm management (i.e. seeking out advice on sustainable farming; equipment maintenance; use of crop rotations)
- Planting (selection of appropriate varieties; optimum spacing; soil sampling and monitoring)
- Soil management (avoiding compaction)
- Nutrient management (choosing fertilizer types for optimum efficiency; nutrient management plans; non-use of untreated sewage and sludge; ensuring that composition of any treated sewage/sludge is acceptable)



- Crop protection (training on and application of integrated pest management; necessity of use of chemical crop protection products; use of selective rather than broad spectrum pesticides and targeted application; prevention of pest resistance; avoidance of crop disease cross-contamination; protection of non-target areas)
- Agro-chemicals (protection of non-target areas)
- Waste management (risk assessment for waste storage and mitigation strategies; waste reduction, reuse and recycling strategies)
- Water management (irrigation water quality; water use management plan to optimize use and reduce waste; over-extraction; use of optimized irrigation methods; avoidance of water and soil pollution; prevention of run-off of agro-chemicals and manure; use of buffer zones to protect adjacent water and wildlife)
- Biodiversity (plan for maintaining or improving biodiversity; non-disturbance/conversion of primary forest, wetland, peatland, protected grassland or other native eco-systems; habitat restoration and compensation)
- Air (assessment, monitoring and mitigation of air pollution risks)
- Greenhouse gas emissions (measures to maximize energy use efficiency; identification, measurement and monitoring of GHG emission sources

Once the self-assessment is complete, the tool provides scores per topic, as well as aggregated scores by sustainability domain (people, planet, profit) and overall. Score levels correspond to either bronze, silver or gold compliance.

According to the SAI Platform website, several companies including Coca-Cola, Unilever and McCain are already using the FSA tool in support of their respective sustainability goals. No web-based literature was identified suggestion that this tool is currently used by any of these companies in Canada generally or in Alberta specifically. Telephone correspondence with a Unilever Canada representative suggested that the Unilever SAC code is being used in Canada as opposed to the FSA 2.0 tool. However, Coca-Cola, Heineken, Mondelez, and Unilever have decided to use FSA 2.0 for beet sugar, directly with farmers/through suppliers and/or as a benchmarking reference, with a current focus on European sugar beet. This tool could hence potentially be relevant for Alberta sugar beet producers in the future.

International Sustainability and Carbon Certification (ISCC) and ISCC Plus

The International Sustainability and Carbon Certification system is a global, supply chain certification system for the ecological and social sustainability of bio-based feedstocks and renewables. It is intended for use in the bioenergy sector, as well as food, feed and chemical markets more broadly. ISCC was developed through an open multi-stakeholder process by roughly 250 international associations. These included corporations, research institutions and NGOs. Its membership currently includes over 80 organizations.

The ISCC system focuses on:



- reduction of greenhouse gas emissions (methodologies to calculate mass balances and verify supply chain GHG emissions)
- avoidance of production on land with high biodiversity value and/or carbon stocks
- good agricultural practices in particular, with respect to protection of soil, water and air
- respect for human, labour and land rights

The prevalent use of the ISCC system to date has likely been the certification of greenhouse gas emission levels and a subset of basic sustainability requirements for biofuel supply chains. The requirements for greenhouse gas emission levels for biofuel feedstocks imported into EU member states, as mandated by the Renewable Energy Directive (RED), have provided particular motivation for the development and application of the ISCC system (ISCC is officially recognized by the RED). ISCC Plus was subsequently developed to cover the broader certification of food, feed, technical/chemical (e.g. bioplastics) and other bioenergy applications (e.g. solid biomass) for sustainability performance across a broader suite of indicator domains.

ISCC provides a series of detailed standards and guidance documents to be used in support of the certification process. A distinct selection of system documents characterizes each of the ISCC certification systems, which are ISCC DE, ISCC DE 36th BImschV, ISCC EU, ISCC DE 36th BImSchV and ISCC PLUS. Farmers wishing to access EU biofuel feedstock markets must complete ISCC EU certification. Using the ISCC system to support claims related to broader sustainability criteria in markets other than the EU biofuel feedstock market requires completion of ISCC Plus certification. The latter requires completion of core ISCC requirements along with additional add-ons. The documents that are common across the EU, DE and PLUS schemes are:

- ISCC 202: Sustainability requirements
 - comprises six principles with their respective criteria covering both ecological and social sustainability issues
 - criteria are defined as either "major musts" or "minor musts" (see annex 1). A successful audit requires satisfaction of all major musts, and 60% of minor musts.
- ISCC 203: Requirements for traceability
- ISCC 204: Mass balance calculation methodology
- ISCC 205: GHG emissions calculation methodology
- ISCC 207: Risk management

The major and minor "musts" that must be fulfilled with respect to ISCC 202 at the whole farm level are organized in terms of six overarching principles, with detailed criteria for each principle. The principles and major criteria (sub-criteria are not listed here – for specific details, see ISCC 202 Annex 1) are:

1. Biomass shall not be produced on land with high biodiversity value or high carbon stocks. High conservation value areas shall be protected.



- 2. Biomass shall be produced in an environmentally responsible way. This includes the protection of soil, water and air and the application of Good Agricultural Practices regarding
 - a. Environmental impact assessment and conservation
 - b. Natural water courses
 - c. Soil conservation and avoidance of soil degradation
 - d. Soil organic matter and soil structure
 - e. Ground water and irrigation
 - f. Use of fertilizer
 - g. Integrated pest management
 - h. Use of plant protection products
 - i. Plant protection products
 - j. Empty plant protection product containers and waste disposal
- 3. Safe working conditions through training and education, use of protective clothing and proper and timely assistance in the event of accidents
 - a. Safe working conditions
 - b. Plant protection product handling
- 4. Biomass production shall not violate human rights, labour rights or land rights. It shall promote responsible labour conditions and worker's health, safety and welfare and shall be based on responsible community relations
- 5. Biomass production shall take place in compliance with all applicable regional and national laws and shall follow relevant international treaties
- 6. Good management practices shall be implemented

ISCC 205 provides the requirements for greenhouse gas calculations and audits. Individual farmers wishing to demonstrate compliance with the ISCC system may provide data based on default values or, if it may be advantageous, undertake calculations based on actual values for their farming activities. ISCC 205 provides the guidance and requirements for each option. For the latter, data on amounts and types of materials used such as pesticides, fertilizers, and energy inputs must be provided, along with information on types and amounts of wastes, yields, and any emissions related to land use change. These data must be supported by documents or other evidence such as production reports, delivery notes, contracts, invoices, etc. Emission factors for converting inputs and outputs into GHG emission estimates must be taken from the "ISCC list of emission factors", which forms part of the ISCC 205 document.

ISCC Plus also provides specific requirements for biomass production systems that produce food (ISCC Plus 260-04) and feed (ISCC Plus 260-03). These documents specify record keeping requirements and specific additional requirements for ISCC Plus 205 for calculating GHG emissions.

ISCC Plus 202-01 specifies the requirements for the "Environmental management and biodiversity" addon. Requirements are provided with respect to management plans for soil, water, energy, and



biodiversity. Each management plan must be preceded by a status determination phase. This is followed by two phases of risk assessment (both natural risk factors and agricultural management risk factors) and development of an action plan, implementation of the action plan, and on-going risk management and monitoring.

The American National Standards Institute (ANSI) accredits certification bodies that will be conducting ISCC certification. The accreditation verifies that the certification bodies comply with the ISCC system as well as relevant international standards.

The necessary series of steps towards obtaining an ISCC certificate include:

- entering into a contractual agreement with an accredited certification body
- registering at ISCC
- preparing for the audit internally
- undergoing the audit by the certification body, and any necessary remedial actions
- certification body submits documentation to ISCC
- receiving certificates for the specific certification chosen

Once certification is received, then the successful applicant may proceed with the permitted uses/applications. These may include demonstration of regulatory compliance (for example, for access to EU biofuel markets) or the use of ISCC logos and claims. More than 10,000 certificates of compliance with ISCC, verified through third-party audit, have been issued in over 100 countries since its inception in 2010.

Since a variety of documents must be used for ISCC certification, there is certainly potential for confusion for new applicants navigating the certification process. Calculations may also be complicated (for example, calculating greenhouse gas emissions for agricultural production). ISCC recommends soliciting expert assistance in undergoing the certification process. Finally, some of the requirements are quite general (for example, "good management practices shall be implemented) hence there may be confusion as to which activities will satisfy the state requirements.

At present, ISCC certification for biofuel feedstocks destined for EU markets is the most relevant of the ISCC system certification options for some Alberta farmers, since it has direct market access implications. However, since ISCC allows for determination of regional values, it is possible for processors to calculate and provide average data for the pool of producers from which they source biomass. The Canadian Crop Carbon Footprint Look-up Tool was designed for this purpose. If this approach is chosen, then farmers may not need to be directly involved in satisfying the informational and procedural requirements of ISCC certification.

ISCC claims cross-compliance with both the Unilever Sustainable Agriculture Code (this requires adherence with the ISCC standard for sustainability requirements (V2.0) and the add-ons 202-01



"Environmental Management and Biodiversity" as well as 202-02 "Classified Chemicals") and the SAI Platform's Farm Sustainability Assessment (FSA 2.0 silver level) tool.

The ISCC program has already issued certificates to several companies operating in Canada such as Viterra (ISCC Plus), ADM Agri-Industries (ISCC EU), Cargill Canada (ISCC EU), and Bunge Canada (ISCC EU).

Potato Sustainability Initiative

Several major customers of potato products have, over time, developed in-house sustainable sourcing requirements for potatoes. The existence of multiple programs created inefficiencies for potato farmers selling product to more than one customer, as well as individual companies implementing their respective programs. The Potato Sustainability Initiative (PSI) was initiated in order to stream-line sustainability reporting and sourcing industry-wide. PSI was developed by a collaboration of processors, growers and customers, including the National Potato Council (US), McDonalds, McCain, Simplot, the Canadian Potato Council, LambWeston, Heinz Agriculture, Cavendish, Basic American Foods, and Sysco.

The PSI has developed an on-line platform where potato growers can complete a detailed questionnaire regarding their practices (i.e. self-assessment), obtain scores for their practices for a variety of socioeconomic and environmental sustainability indicators, and choose to share their results directly with their customers. Growers can also save their results in order to compare their performance from one year to the next, identify areas for improvement, and demonstrate continuous improvement over time.

Scores relevant to environmental outcomes are currently assigned for:

- sustainable farming
 - o seed handling and planting
 - activities to avoid or reduce pest or disease problems and transmission potential
 - use of certified or cleaned seed in rotational crops
 - washing/disinfecting practices
 - assessment of seed handling and planting systems
 - participation in new potato variety tests
 - trials of GM potatoes
 - compliance with regulatory and industry protocols for GM farm trials, and informing customers
 - basis for field selection
 - expansion of cultivation area
 - suitability criteria for field selection
 - uses of GPS
 - o pesticide and nutrient handling and application
 - legal compliance for mixing, storage, use and disposal
 - maintenance of application records for three years
 - equipment calibration



- availability of pesticide spill containment materials at mixing and application sites
- disposal of pesticide containers
- operation of pesticide application equipment within wind-speed limits, and with appropriate parameters to minimize spray drift
- existence and availability of farm drift management plans
- citation by regulatory agency for off-target application of agrochemicals within past three years (not scored)
- consideration of weather forecast prior to nutrient applications
- prevention or minimization of run-off by consideration of soil conditions
- o pest, weed, disease management
 - knowledgeability of staff/advisor regarding major pests/weeds/diseases and their management
 - access to IPM information resources
 - precautions against transport of perennial weeds between fields on equipment
 - control of noxious weeds along field edges
 - basis for management decisions regarding soil-borne pests or diseases
 - herbicide use reduction through non chemical methods
 - locations and frequency of pest and disease scouting, sampling and monitoring
 - monitoring for insect vectors until end of season
 - participation in regional insect and disease scouting programs and information sharing
 - pesticide application decisions and timing based on specific techniques
 - use of biological methods to control/suppress pests/diseases/weeds
 - use of cultural control practices to control pests/diseases
 - partial control of insects/diseases through chemical or non-chemical management of alternate hosts or sites
 - use of banded pesticide application to reduce overall treated area
 - use of spot spray pesticide application to reduce overall treated area
 - partial control of difficult insect pests/weeds in rotation crops
 - basis for pesticide selection
 - identification of pesticide resistance risk, and use of strategies to delay resistance
- o nutrient management
 - complete nutrient management records maintained and available for three years
 - use of biosolids
 - use of animal manure or compost on potato fields
 - use of animal manure or compost follows a nutrient management plan
 - use of grid or zone soil sampling to identify field variability and apply nutrients accordingly



- use of in-season nutrient sampling as per regional needs
- use of remote sensing to monitor crop health
- nutrient application rates as per available nutrients and projected crop need
- use of multiple nitrogen applications or slow release fertilizers where recommended
- inclusion of nitrogen-fixing and recovering crops in at least 25% of potato crop rotation
- phosphorus application so as to prevent losses and associated surface water contamination
- split potassium application when indicated by soil testing
- o management systems
 - implementation of whole-farm soil and water conservation plan to maintain/improve soil and water quality
 - evaluation practices for overall crop management performance
 - communication with respect to farm stewardship improvements
- environmental sustainability
 - o water conservation and quality
 - water obtained as per applicable regulations
 - water conservation measures for facilities are in place
 - preparation and implementation of water withdrawals and uses, including mitigation efforts with respect to detrimental impacts
 - use of irrigation water
 - irrigation water application records, and awareness of rainfall levels
 - evaluation of irrigation system performance and corrective maintenance
 - basis for scheduling of irrigation
 - irrigation technologies that are applied
 - frequency of evaluation of irrigation system efficiency
 - o soil conservation and quality
 - rotation frequency and proportion (at least 75%)
 - soil compaction monitoring and mitigation strategies
 - proportion of acreage where bare soil is covered following harvest
 - use of land structure modification to reduce erosion or water collection problems
 - soil health monitoring and improvement measures
 - o biodiversity
 - sensitive areas on farm are mapped
 - existence of measures to protect sensitive areas, and annual monitoring
 - establishment of production on land not previously cultivated within past three years
 - existence and scope of written plan to protect/enhance biodiversity
 - farm resources invested in converting unproductive or marginal land into conservation areas



- measures in place to identify invasive species and prevent their spread
- o pollinator protection
 - practices for protecting and enhancing pollinator abundance and diversity
- energy conservation
 - scope of energy conservation measures
 - equipment maintenance practices and records to maximize fuel efficiency
- o waste
 - use of fire for waste disposal
 - vegetation burning practices
 - legal compliance of waste water management
 - legal compliance of fuel storage

Information on harvest records, recycling records and worker safety records are also collected.

In total the survey consists of 105 questions for the sustainable farming, social, economic and environmental sustainability sections. In addition, there is a set of questions pertaining to harvest, recycling and worker safety records, and one question regarding farmer participation in a recognized food safety program. The questions predominantly require yes/no answers, or choosing among a set of possible answers. Many of the questions are accompanied by supporting information, which can be directly accessed via mouse click. Category definitions are also provided. Once the survey is completed, scores are generated on a scale of 0-4 for each sub-category, for each of the four parent categories, and as a single, aggregated score.

Overall, the system is easy to use, seemingly quite comprehensive, and provides a very streamlined and direct line of communication between producers and customers. The system is, by nature, based on self-assessment. It is unclear whether or not the system is currently supported by third-party audit. Likely, this would be at the discretion of specific customers. However, the CanadaGAP 2015 Annual Report indicates plans to offer verification audits for growers participating in the PSI. In addition, McCain Foods using CanadaGAP third-party audits along with PSI self, second and third party audits as part of their McCainGAP program for sourcing potatoes.

Canadian Round Table on Sustainable Beef

The Global Round Table on Sustainable Beef (GRSB) released its first set of Principles and Criteria in later 2014. These Principles and Criteria set the global agenda with respect to pursuing more sustainable beef production practices in a set of key areas. They are intended to act as an umbrella for the development of regionally or nationally-appropriate social, environmental and economic sustainability indicators.

The five GRSB principles are:



1. Natural Resources: the beef value chain manages natural resources responsibly and enhances ecosystem health;

2. People and the Community: sustainable beef stakeholders protect and respect human rights, and recognize the critical roles that all participants within the beef value chain play in their community regarding culture, heritage, employment, land rights and health;

3. Animal Health and Welfare: sustainable beef producers and processors respect and manage animals to ensure their health and welfare;

4. Food: sustainable beef stakeholders ensure the safety and quality of beef products and utilize information-sharing systems that promote beef sustainability; and

5. Efficiency and Innovation: sustainable beef stakeholders encourage innovation, optimize production, reduce waste and add to economic viability.

Within this context, the Canadian Roundtable for Sustainable Beef (CRSB) is a national, multistakeholder body that was convened to orchestrate the development of Canadian-specific sustainability indicators, along with a verification system, for beef production systems. Development of the Canadian indicators has been lead by a multi-stakeholder committee of 22 experts. This group was charged with identifying measurable, outcomes-based (i.e. as opposed to prescriptive) sustainability indicators that satisfy the following criteria:

- environmental sustainability
- science-based, and based on expert opinion
- developed through a consensus-based, multi-stakeholder process
- nationally applicable
- consistent with the Global Round Table on Sustainable Beef Principles and Criteria

The first set of draft indicators was made available for public consultation in February 2016. This first set of indicators is specific to the primary production phase of the beef supply chain (i.e. cow-calf operations, backgrounding, feedlot, and dairy beef production). They do not include feed production or post-farm stages, although the CRSB has expressed the intention to similarly develop indicators for these supply chain stages in the future.

The following draft indicators that refer to environmental sustainability concerns or animal health and welfare, organized by GSRB Principle, are as follows:

- Natural Resources
 - management of nutrient run-off, riparian areas, surface and ground water sources to maintain or improve watershed health
 - maintenance or improvement of soil health
 - implementation of beneficial management practices with request to carbon sequestration or minimization of emissions



- o implementation of practices to manage air quality impacts for people and animals
- implementation of practices to maintain or enhance native ecosystems, grasslands, and tame pastures
- o maintenance or enhancement of wildlife habitat
- Animal Health and Welfare
 - o proper animal health promoted through meeting nutritional needs of cattle
 - water supply to cattle is sufficient in quantity and quality to meet their physical needs
 - demonstrability of animal health monitoring and maintenance, including practices related to sick and injured animals
 - demonstrability of responsible use and disposal of animal health products relative to label recommendations or veterinary prescription
 - o demonstrability of steps to mitigate/minimize animal pain
 - \circ demonstrability of clear decision path and acceptable methods for euthanasia
 - stocking densities so as to allow expression of normal behaviour, including resting positions
 - o demonstrability of practices to minimize stress
- Efficiency and Innovation
 - waste reduction, reuse and recycling, as per availability and feasibility of services and technologies
 - o demonstrability of responsible use of energy and resources
 - use of innovation and technology to improve responsible production
 - $\circ \quad$ demonstrability of safe and responsible disposal of crop products
 - o demonstrability of responsible management of dead stock
 - o engagement in continuous learning with respect to sustainability in beef production

These draft indicators, once finalized, will form the basis of "what" will be measured with respect to sustainability in beef production. The CSRB began a complementary stream of work in January 2016 to determine "how" performance for each indicator will be measured. Undertaken by the Verification Committee, this work will consider existing tools and programs that are already in place within the industry, along with whatever else may be necessary to support verification/audit of performance at the farm-level.

Canadian Round Table on Sustainable Crops

The Canadian Round Table on Sustainable Crops (CRSC) is a multi-stakeholder initiative including producers, grain handlers, crop input providers, commodity and food processors, food retailers and restaurants, government and NGO representatives. The Round Table was formed in 2013 to support cross-commodity collaboration on sustainability issues for the participants in the Canadian crops sector. The mission of the CRSC is to "create value for all members of the grains sector by providing a national forum for advancing, reporting on and communicating the sustainability of Canadian grain production."

The Round Tables guiding principles are to be:



- national in scope
- led by industry
- inclusive and transparent
- science-based
- market-responsive
- consensus-based
- supporting on-going improvement
- sharing costs and benefits across the value chain

The CRSC has committed to producing two deliverables: the Canadian Statement of Grains Sustainability, and the Canadian Standard of Grains Sustainability.

Two projects are currently underway in support of producing these deliverables. The first project is the Sustainability Metrics Platform Project. The goal of this project is to develop a full complement of sustainability metrics for regional-scale analysis (where appropriate, and farm-level where necessary) and reporting for each commodity (grains, oilseeds, pulses and specialty crops), along with a reporting platform. This will include generation of research data, as well as identifying which metrics must be developed in order to meet current and emerging value chain needs. Work is already on-going to develop region-specific carbon footprint estimates for each crop. This work builds on the methods used in the Canadian Crop Carbon Footprint Look-up Tool, which was developed by the Canola Council of Canada to support canola producers in gaining access to EU biofuels markets by demonstrating compliance with the requirements of the Renewable Energy Directive. A second study has also been undertaken to determine the extent to which the crops sector currently performs with respect to key social sustainability indicators. The outcomes of these two studies will be used to populate the Sustainability Metrics platform. Completion of the first phase in 2018 is anticipated.

The second project is the CRSC Pilot Project, which will culminate in the Canadian Statement of Grains Sustainability, along with a supporting standard. This pilot project has the following four milestones:

- (1) evaluate indicators of existing programs for their potential utility in the context of Canadian cropping systems, as well as accordance with the CRSC Core Principles and Criteria
- (2) Establish a baseline of practice-based or outcomes-based sustainable production indicators to be applied at the regional level (where possible, or farm level where necessary).
- (3) Involve growers in testing the selected indicators
- (4) Disseminate the project results.

Draft indicators are not yet publicly available for analysis. However, in light of the broad industry representation/participation in this initiative, it may well prove relevant for Alberta farmers. Unclear is how the regional-scale metrics will enable satisfaction of farm-level reporting requirements that may be associated with customer sustainable sourcing initiatives.



Dairy Sustainability Framework and Dairy proAction

In 2009, six organizations broadly representative of the global dairy sector (i.e. European Dairy Association (EDA), Eastern and Southern African Dairy Association (ESADA), Pan-American Dairy Federation (FEPALE), Global Dairy Platform (GDP), International Dairy Federation (IDF) and Sustainable Agricultural Initiative Platform (SAI)) launched the Global Dairy Agenda for Action (GDAA). This Agenda expressed the commitment made by the dairy industry to actively reduce sectoral GHG emissions throughout the value chain. Subsequently, the Dairy Sustainability Framework (DSF) was developed, which is the GDAA program for aligning and connecting sustainability initiatives in the dairy sector. This framework focuses on 11 sustainability criteria that cover environmental, social and economic sustainability issues. The DSF is intended to provide the umbrella framework for local-scale sustainability initiatives and programs in the dairy sector. The 11 criteria are:

- Greenhouse Gas Emissions (quantification and reduction across the full value chain through all economically viable mechanisms)
- Soil Nutrients (management of nutrient application to minimize water and air quality impacts while maintaining and enhancing soil quality)
- Waste (generation minimized, or waste reused and recycled)
- Water (available and quality is responsibly managed throughout the value chain)
- Soil (proactive management and enhancement of quality and retention to optimize productivity)
- Biodiversity (risks are understood and strategies to maintain or enhance biodiversity are implemented)
- Market Development (economic viability for value chain participants through development of transparent and effective markets)
- Rural Economies (sector supports resilience and economic viability of farmers and rural communities)
- Working Conditions (worker safety and rights are respected and promoted)
- Product Safety & Quality (optimal nutrition, quality and safety of dairy products though integrity and transparency across supply chain)
- Animal Care (five freedoms, animal able to engage in relatively normal patterns of behaviour)

The Dairy proAction initiative represents the Canadian response to the GDAA and DSF. It is being developed and implement by the Dairy Farmers of Canada (DFC) and its members. Participation in the initiative is intended to support farmers in providing assurance to customers regarding their efforts to ensure milk quality and safety, along with expectations related to animal care, health and welfare, and environmental stewardship. Participation in and compliance with all requirements of the proAction program will be mandatory for all Canadian dairy farmers, with assurance via third-party audit.

Specifically, the purpose of proAction is to enable farmers to:

- Implement a single, national, credible, practical on-farm initiative
- Address societal demands on dairy farming
- Support the marketing and branding of Canadian milk


The environmental component of proAction is currently based on completion of an Environmental Farm Plan.

Private Company Initiatives

Nestlé Supplier Code

Nestle has developed several publically available documents that outline the company's sustainability priorities, activities, and requirements, including with respect to sustainable sourcing. These documents include:

- Nestle Responsible Sourcing Guideline
- Nestle Supplier Code
- Nestle Policy on Environmental Sustainability
- Nestle Commitment on Climate Change
- Nestle Commitment on Deforestation and Forest Stewardship
- Nestle Commitment on Child Labour in Agricultural Supply Chains
- Nestle Commitment on Rural Development
- Nestle Commitment on Farm Animal Welfare
- Nestle Commitment on the Responsible Use of Materials from Agricultural Origin
- Nestle Commitment on Water Stewardship

In the case of direct supply from farms, Nestle also requires that farmers adhere to applicable Good Agricultural Practices, with guidance provided by the Nestle Responsible Sourcing Guideline for Materials of Agriculture, Forestry, Fisheries and Aquaculture Origin.

Nestle's Supplier Code defines minimum standards that Nestle requires be met by their suppliers and sub-tier suppliers, all the way back to primary production industries. Rather than attempt to directly manage their entire supply chains, Nestle rather requires that each supplier verify compliance of the Code with its own sub-tier suppliers, including farmers. However, Nestle also maintains the right to verify compliance through internal or third-party audit. The standards provided by the Code are intended to foster continuous improvement along the supply chain. For farmers, this includes establishment of milestones and systems to ensure that practices are continuously improved, with market access implications if suppliers fail to meet this requirement. Nestle's procurement contracts explicitly reference the Code, hence committing suppliers to adherence.

The Nestle Supplier Code refers to the following 4 pillars:

- Human Rights
 - o freedom of association and collective bargaining rights
 - o forced labour
 - o employment practices
 - minimum age of employment



- fair and equal treatment
- \circ working time and rest days
- wages and benefits
- Safety and Health
 - workplace environment
 - o housing conditions and respect of privacy
 - o emergency preparedness
 - o product quality and safety
- Environmental Sustainability
 - environmental permits and reporting (legal compliance)
 - environmental management system (must document and implement a system based on international standards such as ISO 14001 to identify, control and mitigate significant environmental impacts)
 - hazardous materials and product safety (basic practices; legal compliance; employee training)
 - resource consumption, pollution prevention and waste minimization (optimization of resource efficiency; implementation of pollution prevention measures; legal compliance of waste disposal practices)
- Business Integrity
 - anti-bribery
 - grievance mechanisms
 - o records
 - origin (traceability)
 - intellectual property
 - o conflict of interest

According to Nestle, "Nestlé expects its suppliers to continuously monitor and verify their performance and continuous improvement against these requirements." Suppliers must also commit to notifying Nestle of any suspected violations, and to submit to audits.

The Nestles Responsible Sourcing Guideline (RSG), which is applicable for the upstream value chain including primary production, complements the Supplier Code. The RSG requirements apply to all materials of agricultural, forestry, fishery and aquaculture origin, with Material Specific Requirements extending the General Principles and Requirements for each priority material. The overall thrust of the RSG is to "remove the worst, promote the best, improve the rest."

Among the General Requirements of the RSG, environmentally relevant requirements include:

- Conversion of natural vegetation
 - no sourcing from areas converted from natural forests after 01-02-2013
 - identification and protection of High Conservation Values (including above ground and soil carbon stocks, water stewardship, livelihoods, species requiring large contiguous habitats, protected areas)



• Environmental impacts

- implementation of water management plan, and additional measures in water stressed areas
- o use of chemicals consistent with best agricultural practices
 - pest and disease management based on Integrated Pest Management programs
- o Soil management consistent with best agricultural practices
 - taking into account soil structure, fertility and erosion
 - fertilizers applied based on soil testing and so as to minimize nutrient run-off and GHG emissions
 - soil carbon levels are maintained and enhanced
 - agrochemical use is minimized
- \circ $\;$ identification and reduction of significant impacts via processes of continuous improvement
 - waste
 - biodiversity
 - GHG emissions
 - energy efficiency

Animal welfare requirements of the RSG General Requirements refer to the "Five Freedoms," which are:

- Freedom from hunger, thirst and malnutrition
- Freedom from fear and distress
- Freedom from physical and thermal discomfort
- Freedom from pain, injury and disease
- Freedom to express normal patterns of behaviour of farmed animals.

In addition to the General Requirements, the RSG provides material specific requirements for each of the 12 high volume materials sourced by Nestle. Of these, those categories that refer to commodities prioritized for the current study are:

- sugar
 - the specific requirements provide additional guidance with respect to sugar cane, but for sugar beets note only that producers must be able to demonstrate compliance with the Nestle RSG
- dairy (fresh milk accounted for 55% of raw materials used by Nestle in 2014)
 - manure management (priority area for continuous improvement)
- meat, poultry and eggs
 - supply chain transparency (Nestle will prioritize supplier relationships for animal byproducts used in pet foods where full traceability is available)
 - for non-GM feed crop markets, industry standards requiring third-party audits should be applied



- for livestock production
 - good husbandry systems must be implemented to prevent occurrence of disease and minimize use of veterinary drugs
 - demonstration of continuous improvement in husbandry practices
 - prevention of feed contamination (legal compliance and demonstration of continuous improvement)
 - use of feed ingredients (legal compliance; medicated feed applied under veterinary supervision in the framework of an animal health plan)
 - use of growth promoters (legal compliance and implementation of long-term phase-out plan)
 - breeding techniques (genetic selection takes into account animal health and welfare; no use of cloned animals or their derivatives in the food/feed chain)
 - animal welfare (animal welfare systems guided by OIE General Principles for the Welfare of Animals in Livestock Production Systems, with emphasis on continuous improvement)

Although not specified in the RSG, Nestle elsewhere indicates that use of gestation crates, veal crates, and battery cages in their supply chains will be phase out over time.

The 2014 Nestle in Society CSR report indicates an objective of sourcing 30% of the volume of these 12 priority categories from sources that are compliant with the Responsible Sourcing Guideline by 2015.

Nestle also applies their Response-Inducing-Sustainability-Evaluation (RISE) tool to help small holder farmers evaluate and reduce farm-level sustainability impacts. For environmental impacts the tool, which uses 10 performance ratings from "problematic" to "good performance," helps identify areas for improvement with respect to crop production, soil use, nutrient flows, water and energy, and potential effects on climate change and biodiversity.

Unilever Sustainable Agriculture Code (SAC)

A core component of the Unilever vision is to double the size of the company's business while reducing overall environmental impacts. By 2020, the company intends to source all of its agricultural raw materials from farms that apply sustainable agricultural practices. To achieve this goal, Unilever expects the cooperation and collaboration of suppliers – in particular at the level of primary resource production, where supply chain impacts tend to be concentrated. Specifically, Unilever requires producers of the agricultural raw materials sourced by the company o commit to demonstrate compliance with minimum performance standards as well as continuous improvement over time.

These minimum performance standards are embodied in the Unilever Sustainable Agriculture Code (SAC). The SAC was developed in consultation with farmers, researchers, and NGOs. The SAC forms the basis of the Unilever Sustainable Sourcing program, which was designed to enable Unilever to measure progress towards its sustainable sourcing goals. Since Unilever typically sources from suppliers such as processors rather than directly from farmers, the company requires its suppliers to commit to ensuring



that farmers are meeting the SAC requirements. The Unilever Scheme Rules describes how suppliers are to provide such assurance.

The SAC describes the Good Agricultural Practices that are expected of Unilever suppliers. The practices are divided into mandatory requirements and "Good Practices." Good Practices are, in turn, described in terms of "must" requirements (mandatory) and "should" requirements, which are strongly advised and have the potential to become mandatory. For practices referring to soils and soil management, these are specific to the fields on which specific crops (including fields in rotation with other crops) are grown. Practices related to social sustainability apply at the whole farm level, as do some aspects of biodiversity and water management. Animal husbandry is currently not comprehensively addressed (i.e. only welfare considerations) in the Unilever SAC.

The SAC is divided into eleven sections, which respectively cover requirements related to:

- 1. Overall continuous improvement
- 2. Agrochemicals and fuels
- 3. Soils
- 4. Water
- 5. Biodiversity
- 6. Energy
- 7. Waste
- 8. Social and Human Capital
- 9. Animal Welfare
- 10. Value Chain and Local Economy
- 11. Training

The SAC document also provides a summary of metrics and risk assessment tools that may be employed.

The following sections provide an overview of the mandatory requirements (not including legal compliance, which is anyways mandatory) for each of the environmentally relevant sections of the SAC as well as animal welfare. For additional "should" requirements, the reader may refer to the SAC document.

Overall Continuous Improvement

• monitoring compliance with the SAC and pursuing continuous improvement

Agrochemicals and Fuels (including Crop Protection Products and Synthetic Fertilizers)

- records must be kept accessible for at least two years
- strategic commitment to Integrated Pest Management
- records to justify agro-chemical applications (pest monitoring, nutrient balance calculations)
- agro-chemical application records
- records of spills and remedial actions taken



- spray equipment calibration and maintenance records
- agrochemical stores records
- risk assessment records of all phases of use
- training records for handlers
- vendor details
- continuous improvement with respect to phasing out WHO 1a and 1b compounds, including a phase-out plan

Nutrient Management

- decreasing nitrogen release to the environment (Nitrogen balance metric provided)
- prohibition against disposing of fertilizers and their packaging in surface or ground waters
- prohibition of application of untreated human sewage or sewage-contaminated water
- implementation of crop nutrient management plan which aspires to optimize nutrient use efficiency, including:
 - o clearly assigned responsibilities for planning and implementing crop nutrition
 - o consideration of soil's chemical, biological and physical composition
 - locally-specific targets for crop nutrition based on nutritional requirements, desired yield and quality
 - amount of N and P applied justified by gap between actual and target nutrient supply, considering all sources
 - o nutrient balance calculations
 - records of justifications for fertilizer applications
 - application to intended crop area only, specifically avoiding water bodies, wildlife habitats and places of work or residence
 - documented measures to avoid N and P loss, including application timing, choice of fertilizer type, soil conditions, and application techniques

Pest Management

- provision of necessary data for use of "Chemical use" and "Water" metrics, with the aim of reducing use of hazardous CPPs
- use of Crop Life International standards for safe and effective use of CPPS where these exceed national legislation
- prohibition of handling or applying CPPs by children under 18 or pregnant/nursing women
- prohibition of CPP application by personnel without basic training
- disposing of CPP containers in ground or surface waters
- re-using CPP containers for any purpose other than recycling by a professional vendor
- documented, strategic commitment to Integrated Pest Management
- IPM system in place, including:
 - o responsibilities for planning and carrying out pest control and implementing IPM
 - o processes and criteria for choosing suitable growing areas, rotations and varieties
 - \circ $\;$ cultural control of pests to prevent build up or survival of inoculums
 - identification of key pests and understanding of their life cycle, with established action thresholds





- checking actual infestation levels against action thresholds using appropriate sampling method
- o justification of use of any CPP
- o documentation of infestation levels and control measures
- o choice of CPP informed by environmental and human health risks
- \circ ~ use of preferred list of CPPs for the crop, as supplied by the customer
- application of CPPs in conformity with label requirements
- assessment of suitability of CPP prior to application
- observance of safety precautions prior to application of CPP
- application to target areas only
- safe disposal of CPP contaminated material
- procedures in place to deal with spills or accidents
- application records made at time of application
- application records traceable to field, containing rationale, timing, ingredient name and amount applied

Agrochemical Safety and Risk Assessment

- risk assessment covering risks to operators, neighbours, consumers, water, soil, air, biodiversity
 and GHG emissions, taking into account: use; transport; storage; handling; choice of
 agrochemicals and equipment; filling, cleaning and maintenance of equipment; handling and
 disposal of packaging and contaminated material
- use of appropriate personal protective equipment where indicated by risk assessment
- applicator knowledge of use of protective equipment
- accessibility and understandability of label details to operators
- availability and use of washing facilities after handling agrochemicals and contaminated material
- protective equipment cleaned after use, separately from other washing and not by children or pregnant/nursing women
- storage of protective equipment separately from agrochemicals and personal/household items
- avoidance of health and safety risks to bystanders
- purchased agrochemicals in original packaging only, with all label details legible
- purchased agrochemicals from nationally or industry recognized vendors only
- up-to-date records of agrochemical vendors used
- prohibition of using agrochemical containers to store food, water or feed
- reuse of CPP containers for same product only, and only where specifically intended for reuse
- return of CPP containers to suppliers wherever possible
- CPP containers triple-rinsed and punctured prior to disposal
- safe disposal of synthetic fertilizer packaging if safe reuse not possible
- off-farm disposal of agrochemical waste by legally approved contractors

Agrochemical and Fuel Storage and Equipment

- agrochemical application equipment maintained in good working order
- agrochemical application equipment checked before and cleaned after use



- equipment delivers desired flow rates and even distribution as per available recommendations
- machine applicators checked at least annually for correct spread pattern
- sprayers checked at least annually for correct spray volumes and patterns
- appropriate nozzles used, checked, and replaced where damaged
- storage facilities suitably constructed and kept dry and well ventilated
- storage constructed so as to minimize risk to people and environment, including during emergencies
- storage kept secure and locked to prevent access by children and unqualified persons
- fertilizers not stored together with CPPs or fuel
- records kept for all stored agrochemicals
- handling and washing areas designed such that spillage can be confined
- agrochemicals and contaminated materials handled as per manufacture specifications, separate from food, feed, living quarters, and food preparation areas
- all fuel stores constructed of suitable materials and located so as minimize risks
- stores of highly flammable fuels kept secure

Soils

- maintenance of records for soil management and conservation system, risk assessments and resulting actions, decisions and actions of implications of land expansion, and monitoring of soil quality parameters
- plans in place to phase out use of peat, forest top soil and other on-renewable materials for substrates and soil amendments within three years
- provision of data for calculating "Soil health" metric
- prohibition of disposal of wastes and chemicals on land, unless explicitly allowed and safe for application on agricultural land for food production
- documented soil management and conservation system in place
- evidence proving that soil management and conservation system ensures
 - \circ ~ planning and carrying out of responsibilities is assigned to a competent person
 - o crops only grown on soils proven to be suitable for that crop/rotation
 - o crop suitability and environmental implications assessed where land use is expanded
 - o risk of soil erosion and loss is assessed and managed
 - $\circ \quad$ risk of soil chemical degradation is assessed and managed
 - risk of soil compaction is assessed and managed
 - o risk of soil contamination is assessed and managed
 - o soil organic matter is managed to reach or maintain optimum concentration
 - o precautionary measures taken where risks or evidence suggest this is necessary
 - \circ corrective action taken when soils have been damaged
- Soil quality monitoring required and records kept for at least five years for: concentrations of macronutrients; pH; soil organic matter; salinity, nutrients or heavy metals if risk of crop or environmental damage

Water



- maintenance of records (2 years minimum) for application (reason, application rate and amount related to evapo-transpiration, field capacity, time and date, location, application technique and operator, calibration and testing of equipment)
- provide data necessary to support calculation of "Water" metric
- prohibition of using streams and rivers as waste dump
- use and recharge rates of water sources for irrigation assessed to check source sustainability
- water harvesting operations monitored to check they do not affect downstream users including high biodiversity value areas
- risk assessment aimed at preventing direct and indirect surface and ground water pollution, including from: siltation; nutrients; agrochemicals and other chemicals; fuels, lubricants and solvents; contaminated run-off; livestock; human sewage; waste water
- irrigation management system in place where irrigation is used , ensuring: timing and amount of
 irrigation is tailored to meet crop requirements under local conditions; application technique is
 appropriate to water availability and ensures highest use efficiency; mechanisms in place to
 prevent over application; unproductive losses due to evapo-transpiration minimized through
 choice of application time/conditions when sprinkling and overhead irrigation are used
- irrigation water quality monitored and managed
- irrigation equipment maintained in good working order

Biodiversity

- records kept (at least 2 years) showing: strategic commitment to at least one local/regional biodiversity initiative; training records for farmers and farm workers
- provision of data to support calculation of "Protect and improve habitats for biodiversity" metric
- prohibition against destroying important habitats on and off farm, hunting or poisoning rare/endangered species, and collecting rare/endangered species
- development and implementation of locally appropriate Biodiversity Action Plan that includes: an assessment of locally relevant biodiversity issues; a practical plan to advance in at least one area of biodiversity conservation/protection/equitable use or education
- hunting, fishing and gathering of wild species in designated areas only
- Biodiversity Action Plan must support any rare/endangered species or habitats found on local farmland
- any land conversion greater than 1 ha must be proceeded by full Environmental Impact Assessment, with all recommendations followed
- farmers are aware of available government support for biodiversity work
- all prohibitions regarding biodiversity are made known to staff, workers, hunters, fishermen, wild harvesters, and members of the public allowed to operate on the farm

Energy

- records maintained (at least 2 years) for: Energy Management Plan; demonstration of lack of alternatives if using fire for land preparation; risk assessment and resulting actions; operator training records
- provision of data to support calculating "Carbon footprint" metric



- prohibition against taking fuel from important habitats or protected areas where this threatens the size or integrity of such areas
- implementation of documented Energy Management Plan designed to reduce energy consumption
- health, safety and environmental risk assessment for: liquid fuels and lubricant transport, storage, handling, spillage and disposal; machines, generators, boilers, pumps, power tools, etc.; electrical installations and power lines; disposal of ash
- waste solvents, plastics, CPPs, medical waste, etc. not disposed of in boilers or incinerators unless explicitly rated for this kind of use
- appropriate use of personal protective equipment, and operator knowledge regarding its use

Waste

- records maintained (at least 2 years) for: demonstration of lack of alternatives for using fire for disposal of harvest residues, if applicable; training records
- prohibition against storage of hazardous waste where unauthorized people have access or in locations may foreseeable events may result in leakages or loss to the environment
- Waste Management Plan must be place that: respects the hierarchy of waste reduction, reuse, recycling, energy recovery and disposal; includes estimates of major waste flows from the farm; lists the waste reduction, reuse and recycling options already in place or under investigation, and routes of energy recovery or disposal for other wastes
- waste streams must be separated, stored and managed separately
- waste storage locations must not create health or safety hazards
- waste must be properly labeled and contained
- where national regulations do not exist for storage of hazardous waste, guidance or best available options locally must be sought
- hazardous waste stores must be constructed and located so as to minimize risks, including during emergencies
- must be separate storage for different types of hazardous waste
- procedures are in place to ensure potential release of hazardous waste does not incur significant human or environmental risk
- if no national regulations for disposal of different types of hazardous waste, guidance on best available options locally must be sought
- incinerators and burning sites fit for purpose
- care taken that waste materials such as PVC and certain other plastics are never burnt in open fires or low temperature incinerators
- on-farm waste disposal systems and practices must be documented, and risks to human and environmental safety assessed and improved
- all waste buried on-farm must be covered in a layer of soil, normally at least 50 cm thick
- litter and other waste must not be thrown into areas that might flood
- a risk assessment must be performed covering all hazardous farm waste streams, and the outcome used to prioritize actions to protect people and the environment from significant hazards





Animal Welfare

- records must be maintained (at least 2 years) for: application records for veterinary medicines/CPPs given to animals; training records for animal stock persons; records of withdrawal periods; animal health plan
- prohibition of direct physical abuse and mental suffering of animals
- freedom from hunger, thirst and malnutrition
- feed and water distributed so as to prevent undue competition
- husbandry environment must take into account welfare needs, including protection from physical and thermal discomfort, fear and distress, and allow performance of natural behaviours
- managers and stock keepers are thoroughly trained, skilled and competent in animal husbandry and welfare
- animals protected from pain, injury and disease
- husbandry environment is conducive to good health
- documented health plan, developed in consultation with a veterinary surgeon, is in place
- health plan records for an animal are kept for two years after disposal of the animal
- health plan records are traceable back to the animal and contain: reasons for treatment; time of application; product name; amount applied

Since farming systems are highly diverse, and conditions, available technologies, and best practices may be context specific, the SAC communicates what is expected in terms of sustainable practices, but is not specific as to how these are achieved. However, Unilever does provide on-line implementation guides as a source of information for suppliers and farmers to support their efforts to comply with the Code.

If farmers are already complying with the codes and standards of other sustainability programs, then the Unilever code is held as a benchmark, with additional requirements implemented only where the existing standard does not meet Unilever's SAC requirements. Unilever maintains a list of recognized external codes and standards, which is provided as an Annex to the Scheme Rules document. Unilever will also consider in-house or industry-level sustainability schemes that their suppliers use. In such cases, suppliers must benchmark their programs against the SAC, and any items not covered must be checked through self-assessment.

Unilever, in partnership with the software company "Muddy Boots," has developed a system called "Greenlight Assessments" to collect information from suppliers regarding compliance, calculate scores, and track continuous improvement metrics. Farmers or suppliers are able to enter their data directly into the Greenlight Assessments system.

Unilever currently allows use of mass balance systems by suppliers in reporting amounts of sustainability produced materials, subject to certain conditions. These include the intention to develop segregated supply chains over time, demonstration that such segregation is not feasible in the short term, and the implementation of an independently verified administrative system to prevent double counting.



Primary processing plants are charged with farm-level assessments among the pool of producers from whom raw materials are sourced. Random sample of farms are selected for self-assessment through the Greenlight Assessments software system, or by a Unilever representative if the Greenlight system is not used. Farmers are counted as compliant if:

- 100% of mandatory requirements are met
- 80% of applicable "musts" are met in total
- 50% of applicable "musts" are met for each SAC chapter

Self-assessments are verified through random sample spot-audits by an independent verification body commissioned by Unilever, weighted by sustainability risk assessments for the raw material origin.

Unilever has prioritized sustainable sourcing activities for a subset of key commodities. Those of relevance for the priority Alberta commodities considered are sugar, canola oil, dairy, and eggs (cage-free). The company reports sourcing 55% of its agricultural raw materials sustainably as of 2014, with goal of achieving 100% sustainable sourcing by 2020. Discussion with a Unilever Canada spokesperson indicated that Unilever is likely not currently sourcing Alberta product, although this may potentially change in the future. For example, Unilever currently sources Saskatchewan canola, via Bunge, for use in both Hellmann's and Becel products. Unilever is also working towards sustainably sourcing wheat in the US, which may potentially be expanded to Canada in the future.

General Mills

General Mills has declared a goal to sustainably source the raw materials used in their products. In the short-term, this goal includes sourcing 100% of its 10 priority ingredients by 2020, which will represent more than 50% of total annual raw material purchases.

Towards this end, the company is involved in several multi-stakeholder initiatives to develop sustainable sourcing frameworks as well as pilot projects. These efforts target both small-holder producers in developing countries and large scale growers in developed countries. For raw material supply chains, a combination of certification, verification, continuous improvement and origin-direct investment approaches are employed.

The General Mills requirements for suppliers are detailed in the General Mills Supplier Code of Conduct. The Code covers human rights, health and safety, environment, and business integrity. The "environment" section of the code is very general, stating only that "At General Mills, our goal is to continually reduce our environmental footprint. In addition to complying with all applicable environmental laws, we expect you to continually improve your own environmental performance."

Among General Mills priority raw materials for sustainable sourcing of direct relevance for the current analysis are oats, wheat, sugar beets and corn. The company currently sources oats, wheat, canola and pulses from Western Canada - primarily from Saskatchewan and Manitoba. Efforts related to row crops



focus on continuous improvement, as demonstrated based on measurement of year-on-year progress compared to baseline data.

As of 2014, General Mills reports that over 100 North American growers are participating in their sustainable sourcing activities. Grower participation ranges from 10-25 growers and 50,000 - 125,000 acres in each key growing area. The entire crop rotation is considered, which expands the focus beyond the core priority crops to also include lentils, peas, canola and potatoes. The purpose of these pilot activities is to support development of a scalable program and verification protocol. Once the North American protocol and methodology is complete, this approach will be replicated in other regions.

In the US, General Mills is a member of the US Field to Market initiative, which developed the US Field Print Calculator. It appears that the Field Print Calculator is being employed to support the General Mills pilot projects and data collection in the US. In Canada, General Mills has a partnership with Serecon, which developed the Canadian Fieldprint Calculator. A pilot project was initiated in Manitoba and Saskatchewan to measure the sustainability of oats and other rotational crops including wheat, canola, and pulses, using the Canadian Fieldprint Calculator. In 2014, additional partners joined the pilot project, with the aim of collecting three years of baseline data regarding yields, soil carbon, energy use and greenhouse gas emissions. Once this initial baseline is completed, growers in the program will be able to measure and make improvements relative to the baseline.

General Mills has identified the following specific sustainability issues related to their priority raw materials:

- oats (General Mills will source 100% of oats from regions demonstrating continuous improvement against industry-based environmental metrics by 2020)
 - o declining supply US wheat GHG emissions, water use, biodiversity
- US sugar beet
 - o GHG emissions
 - o soil loss
- fluid milk (by 2020 General Mills will source all fluid milk from regions that demonstrate continuous improvement based on the Dairy Sustainability Framework in the US and comparable metrics globally)
 - o GHG emissions
 - o water use
 - o water quality
 - o animal welfare

Molson-Coors

Molson-Coors established Supplier Standards in 2012. These standards set minimum expectations for suppliers with respect to environmental, social and economic sustainability. The standards also refer to a policy specific to Agricultural Brewing Ingredients.



Suppliers are expected to take actions to limit the environmental impact of their operations, and to have appropriate programs in place to facilitate achieving this objective. Specific expectations of potential relevance to farmers include:

- Energy
 - o optimization of energy efficiency
 - o use of clean and low energy sources
- Emissions to Air
 - o work collaboratively with Molson-Coors to reduce emissions to air
 - provide life cycle GHG emissions data for manufacture and supply of products and services (may be requested in tender documentation and influence procurement decisions)
- Natural Resources
 - o comply with Agricultural Brewing Ingredients policy
- Biodiversity
 - o implement biodiversity action plans for high risk categories
 - demonstrate compliance with good practice in habitat management where activities significantly impact species or habitats
 - o comply with Agricultural Brewing Ingredients policy
- Water
 - o quantify water consumption and demonstrate plan to reduce consumption over time
 - undertake water risk assessment and progress towards implementing risk mitigation for operations in water stressed areas
- Waste
 - o legal compliance
 - o collaborate in waste reduction activities, work to ensure alternatives to landfill disposal
- Pollution
 - o demonstrate legal compliance and good practice in management of pollution to land, air or water

The Molson Coors Supplier Standards further specify that the company will preferentially source agricultural materials from producers who embrace their sustainability standards, in particular as described in the Agricultural Brewing Ingredients Policy. This policy provides six pillars which suppliers must recognize and adopt:

• Comply with Molson Coors-quality specifications





- Adopt agricultural practices that will strive to maintain soil fertility, water resources, air quality and biodiversity.
- Manage natural resources in an efficient manner
- Recognize the importance of accreditation and where established adopt accreditation to appropriate farm assurance programs.
- Meet food safety guidelines and traceability specifications
- Understand and address any future guidelines, best practice, and legislative changes that may arise.

Based on the Supplier Standards, the company has a four stage process for identifying, assessing and managing sustainable procurement risks. These stages are:

- Stage 1 Screening
 - conduct initial screening of supplier base by considering risk, opportunity for change, and magnitude of impact by supply category, focusing on
 - energy use
 - emissions to air
 - natural resources
 - biodiversity
 - water
 - waste
 - pollution
 - labor practices
 - ethics
 - regulatory compliance

• Stage 2 - Qualification

• suppliers will be requested to provide data and comments during tendering process on for the category area, as raised in Stage 1

• Stage 3 – Supplier development

• Successfully-appointed suppliers will be provided with further support and guidance, enabling improvements against the standards

• Stage 4 - Audit

- Suppliers who are identified to represent the highest potential risk may be audited to ensure that the minimum expectations are met and that risks are being mitigated.
- All suppliers are expected to provide information about a raw materials social, environmental and ethical performance. If any information provided warrants further investigation, an independent auditor may be commissioned to examine the information provided, at the expense of the supplier





Where Molson Coors sees a necessity, suppliers are requirement to implement management systems to facilitate continual improvement and compliance with the standards. The necessary components of the management are:

- Demonstration of commitment to accountability
- Demonstration of compliance with legal and customer requirements
- Implementation of risk management mechanisms specific to the requirements of the standard
- Documentation demonstrating conformity with the standard and applicable regulations
- Training and competency programs to support meeting the standard requirements
- Demonstration of continual improvement

As of 2014, the Supplier Standards are an on-going requirement for 100% of Molson-Coors global supply base. In addition, the company is using a Supplier Quality Scorecard that includes sustainability metrics to track the environmental performance of Tier 1 suppliers on a quarterly basis, and to reward those who achieve the best results. The Molson-Coors Supplier Standards must be implemented throughout the supply chain, including by sub-contractors. This program may be of relevance for Alberta barley producers.

Loblaw

Loblaw is generally regarded as proactive in sustainable sourcing among the major Canadian grocery retailers. The company is a member of the Canadian Round Table on Sustainable Beef and also employs sustainable sourcing strategies for palm oil (Round Table on Sustainable Palm Oil) and seafood (Marine Stewardship Council and Aquaculture Stewardship Council.) With respect to the former, Loblaw is the retail representative in the McDonalds-led pilot project to create a verification process for sustainable beef. These activities are organized under the umbrella of the Loblaw in-house "Sourcing with Integrity" program.

Loblaw has made the following two public commitments regarding sustainable sourcing that are directly applicable for a subset of Alberta farmers: transition the PC Blue Menu line of eggs to free-run (to date, all PC and PC Organics eggs are free run) and to source fresh pork from vendors that have transitioned to loose housing by 2022 based on animal welfare considerations. Although the company does not currently have sustainable sourcing activities implemented for the commodities of concern in this study, it was deemed interesting to include Loblaw as an example of activity levels in the Canadian grocery retail sector.

Kellogg's

Kellogg's has committed to responsibly source its top ten ingredients and materials by 2020. Of these ingredients, those among the key Alberta commodities considered in the current analysis are wheat, oats, potatoes and sugar beets. All suppliers of these materials will be required to meet Kellogg's



sustainability guidelines, which include a combination of certification and documentation of continuous improvement.

Kellogg's' Supplier Code of Conduct was first developed in 2009 and subsequently updated in 2014. Suppliers to Kellogg are required to verify compliance of their own supply chains, and allow Kellogg or an authorized third party to conduct audits to verify compliance.

The Code refers to the following areas (specific details provided here for environmental sustainability consideration only):

- Business Integrity
 - o legal compliance
 - o anti-corruption
 - o conflicts of interest
 - o business gifts
 - o fair competition
 - o confidential information
- Quality, Health and Safety
 - o product safety
 - o work environment
- Labour Standards
 - o human rights
 - o no involuntary labour
 - o child labour
 - o fair wage and working time
 - o no harassment
 - o no discrimination
 - o right to organize
 - o work documentation
- Management Practices
 - o systematic approach
 - o supplier diversity
 - o record keeping
 - o compliance verification (suppliers must verify compliance of supply chain against Supplier Code)
 - o reporting concerns
- Sustainability/Land Use
 - o Environment
 - legal compliance



- implementation of operating practices, farming practices and agricultural production systems that are sustainable
- activities to reduce or optimize use of energy, water, and agricultural inputs, reduce GHG emissions, minimize water pollution and waste including food waste and landfill usage
- o Initiatives
 - suppliers should (in some cases must) be members of relevant multistakeholder initiatives such as RSPO (palm oil), BonSucro (sugar), RTRS (soy), WCF (cocoa), Field to Market (US commodity row crops)
- O Land Rights
 - must respect land rights of women and communities affected by their operations, ensure transparent reporting and disclosure of concession agreements, and ensure fair negations on land transfers

In the US, Kellogg works with corn farmers using the US Fieldprint Calculator. With four years of baseline data, this work is now focused on identifying and communicating best practices. The company is now expanding its focus to wheat, including in Canada.

The Kellogg Supplier Code is quite general. In the absence of specific requirements and verification mechanisms, Alberta farmers may be challenged in satisfying the code requirements. Given Kellogg's current collaboration with US farmers using the Fieldprint Calculator, it is possible that similar implementation of the Canadian Fieldprint Calculator may be required of Alberta farmers in the future.

Sysco

Sysco is a major food service company, with international presence. The Sysco Canada website provides very little content related to sustainability initiatives. However, the US website does provide a considerable volume of information regarding Sysco's sustainability initiatives. It is not clear whether or not this material is also currently relevant in Canada at present.

Sysco US employs a Supplier Code of Conduct covering human rights, health and safety, and environmental standards. All suppliers are expected to meet the standards described by the Supplier Code of Conduct. According to the Sysco (US) website: we demand that suppliers of Sysco Brand goods meet the highest standards of accountability with their social, agricultural and animal welfare practices. We require animal welfare and quality assurance audits and conduct follow-up audits to ensure improvement plans are implemented."

Sysco has developed a Sustainable/Integrated Pest Management (IPM) program to promote the responsible use of inputs to agricultural production of Sysco Brand canned and frozen fruits, vegetables, and potatoes as well as use of cover crops, crop rotations, and natural pest control practices. This



program may potentially be relevant for Alberta potato farmers. Sysco-required IPM practices must be applied on the whole-farm level, rather than acreage devoted solely to production for Sysco. As of 2013, Sysco's IPM program involved 180 food factories and close to 900,000 cultivated acres. Sysco similarly implements water conservation, agricultural waste, energy, and animal welfare-related requirements.

Among Sysco's stated requirements or "encouragements" are that participating suppliers address the following areas:

- Integrated Pest Management (IPM)
 - o track pesticide use, with the goal of reducing quantity or toxicity
 - o protect and create and habitat and forage sources on the farm for pollinators
- Water Conservation
 - o measure all water used for irrigation
- Agricultural Waste
 - o measure and report how much vegetative waste they reuse
- Energy
 - o report fuel conservation from in-field operations
- Animal Welfare
 - complete ongoing self-assessments of animal care programs, and allow unannounced, third-party audits of their facilities as well as by Sysco QA employees

In addition, Sysco has expressed that it is working with pork suppliers towards the creation of a gestation crate-free pork supply chain.

Costco

The Director of Environmental Affairs for Costco Canada indicated in reply to an email query that Costco Canada sustainable sourcing activities follow those of Costco US. The Costco US website describes Costco sustainability activities – most of which focus on Costco store-level concerns. One consideration that is relevant for some Alberta farmers are the Costco policies on animal welfare. Costco may undertake audits of egg laying, dairy cow, pork, poultry (chicken and turkey) and veal production facilities.

The Costco animal welfare policies also stipulate:

- dairy
 - o no tail docking
 - o standards for dehorning
- veal





- o calves may not be tethered in stall
- o minimum 2 calves per stall after 8-10 weeks
- o stalls must allow calves to turn freely, lie down, and maintain normal postures
- o calves must be inspected at least twice daily for cleanliness
- o proper ventilation must be assured
- o veal barns must have at least one annual third-party audit for humane handling
- o veal barns must be visited by a veterinarian at least once every grow-out cycle
- o electric prods may not be used
- o non-ambulatory animals may not be used in production
- pork
 - o complete phase out of gestation crates by 2022
 - o all hogs housed in groups with access to safety zones by 2022
- poultry
 - o hatchery and grow-out facilities subject to audit
 - o working towards 100% cage-free eggs

Walmart and the Sustainability Consortium

Walmart sustainability initiatives have been among the most widely publicized, in large part due to the ambitious goals communicated by Walmart as well as the significant funding allocated by the company to support the Sustainability Consortium. Walmart was among the first of the major retailers to announce plans to begin to apply a sustainability index to rank its suppliers, and to preferentially source from suppliers with higher ranking. Among Wal-Mart's public sustainability commitments is to source 70% of the products it sells in North America from suppliers employing the Walmart Sustainability Index by 2017.

The Walmart Sustainability Index collects information from suppliers for:

- Energy and Climate Reduce Costs and Greenhouse Gas Emissions
 - o measurement of corporate greenhouse gas emissions
 - o reporting greenhouse gas emissions to the Carbon Disclosure Project
 - o total greenhouse gas emissions reported in the most recently completed report
 - o setting publicly available greenhouse gas reduction targets
- Material Efficiency Reducing Waste and Enhancing Quality
 - total amount of solid waste generated from the facilities that produce a suppliers product (if measured)
 - o existence of publicly available waste reduction targets, and target details
 - o total water use for facilities that produce a suppliers products (if measured)
 - o existence of publicly available water use reduction targets, and target details



- Natural Resources: Producing High Quality, Responsibly Sourced Raw Materials
 - establishment of publicly available sustainable purchasing guidelines for direct suppliers that address environmental compliance, employment practices, and product/ingredient safety
 - o any 3rd party certifications for products sold to Walmart
- People and Community: Ensuring Responsible and Ethical Production
 - o knowledge of locations of 100% of facilities that produce the products sold to Walmart
 - evaluation of production quality and capacity prior to beginning a business relationship with a manufacturer
 - o implementation of a process for managing social compliance at the manufacturing level
 - efforts to resolve any supply base social issues that are identified, along with documentation of specific corrections and improvements

Under the Natural Resources section, the Walmart Sustainability Index inquires whether or not the supplier has established publically available sustainable purchasing guidelines for direct suppliers that address, among other things, environmental compliance. A similar query relates to achievement of third party certification. These questions indicate that, rather than establish a prescriptive set of sustainable sourcing criteria for implementation across product groups, Walmart rather leaves it to suppliers to ensure that appropriate systems are in place. Here, there is likely substantial complementarities with the work of the Walmart-supported Sustainability Consortium.

The mandate of the Sustainability Consortium is to develop science-based decision support tools for improving the sustainability of consumer products. It currently includes over 100 of the world's largest organizations, many of these active in the food sector (for example, Cisco, Coca Cola, Cargill, Dow, DuPont, Kellogg's, Mars, General Mills, Campbell's and Hershey's).

The Sustainability Consortium is developing a Sustainability Measurement and Reporting System, which is tailored to the product category level. The decision support material for each product category consists of Sustainability Insights and Product Sustainability Toolkits. The Sustainability Insights are publically available for download. They provide an overview of key supply chain variables for sustainability management.

Product Sustainability Toolkits are available to TSC affiliates only. These are interactive tools that highlight important sustainability issues for each product category, describe mitigation measures, and specify Key Performance Indicators for tracking and measuring performance. These are largely checklist metrics that companies can use to assess their supply chain partners for compliance.

The Food, Beverage, and Agriculture Sector Working Group was the first sector-level group to be established. The Working Group's mandate is to improve the environmental and social sustainability of global agricultural supply chains. The Working Group has developed product category-specific decision support material for numerous product categories to date. Those of relevance for Alberta include beef, chicken, eggs, pork, grains, barley and malt, sugar, beans/lentils/peas, bread, and potatoes.



During a discussion with a Canadian Walmart supplier, it was suggested that Walmart has currently scaled back its sustainability initiatives in Canada, and relocated human resource capacity in this regard to their US headquarters. Inquiries directed to Walmart Canada to discuss their activities were not replied to, hence it was not possible to verify this information.

ADM

ADM is an agricultural processor with global presence. As a major nexus point between raw material producers and customers, ADM is hence ideally positioned to mediate the requirements of sustainable sourcing programs that are applicable at the farm level. Indeed, ADM is actively involved in several such initiatives. For example, in the US, ADM is involved in the US Field to Market initiative. ADM also implements Unilever's sustainability requirements for procuring soy oil used in Hellmann's brand mayonnaise in the US. In Europe, ADM Oilseeds production facilities are ISCC Plus certified, which enables them to provide certified edible oils to customers.

In Canada, the ADM facility in Lloydminster is ADM's first certified sustainable location in North America. Based on the ISCC system, the Sustainable Growers program implemented by ADM in Alberta enables growers able to demonstrate compliance with program requirements access to market premiums. This program is voluntary, and is currently used by growers to facilitate access to EU biofuels markets. However, the program could potentially be applied to other raw materials, including animal feeds. Participants in the program undergo self-assessment, followed by ADM audit and, potentially, thirdparty audit. ADM Lloydminster was contacted to request specific details regarding the Sustainable Growers program. Unfortunately, these were not made available. Despite the paucity of information regarding ADM's sustainable sourcing activities in Canada, it was nonetheless decided to include the company in the analysis as an example of a Canadian processor engaged in sustainable sourcing activities.

Pepsico

Pepsico has developed a Global Supplier Code of Conduct that suppliers are expected to follow. The Code details the following 14 principles to which supplier must adhere:

1. Maintain awareness and comply with all applicable laws and regulations of the countries of their operation.

2. Compete fairly for PepsiCo's business, without paying bribes, kickbacks or giving anything of value to secure an improper advantage.

3. Encourage a diverse workforce and provide a workplace free from discrimination, harassment or any other form of abuse.

4. Treat employees fairly, including with respect to wages, working hours and benefits.



5. Prohibit all forms of forced or compulsory labor.

6. Prohibit use of child labor.

7. Respect employees' right to freedom of association and collective bargaining, consistent with local laws.

8. Provide safe and healthy working conditions.

9. Carry out operations with care for the environment and comply with all applicable environmental laws and regulations.

10. Maintain accurate financial books and business records in accordance with all applicable legal and regulatory requirements and accepted accounting practices.

11. Deliver products and services meeting applicable quality and food safety standards.

12. Support compliance with the Supplier Code by establishing appropriate management processes and cooperating with reasonable assessment processes requested by PepsiCo.

13. Observe PepsiCo's policies regarding gifts and entertainment and conflicts of interest when dealing with PepsiCo employees.

14. Report suspected violations of the Code.

With respect to environmental considerations (Principle 9), the Code is very general, stating only that "The potential environmental impacts of daily business decision-making processes should be considered along with opportunities for conservation of natural resources, recycling, source reduction and pollution control to ensure cleaner air and water and to reduce landfill wastes."

Elsewhere, PepsiCo's 2014 CSR describes the company's five key environmental goals and associated value chain activities, which are to:

- Protect and conserve water
 - work with farmers to develop effective water management plans for addressing water risk and share best practice water-efficient drip irrigation methods
- Minimize impact from packaging
- Eliminate waste to landfills
- Reduce GHG emissions (including along the value chain)
- Support sustainable agriculture
 - PepsiCo's Sustainable Agriculture Policy is supported by the company's Sustainable Farming Initiative (SFI)

PepsiCo's Sustainable Agriculture Policy details more specific principles for sustainable agriculture. According to this policy, sustainable agriculture should:



- Integrate environmental, social, and economic sustainability within agricultural production.
- Comply with governmental laws, regulations, and industry standards.
- Integrate approved and credible science and technology, where applicable.
- Enable local farming communities to protect and improve their well-being and the environment in which they operate.
- Optimize the use of resources to improve farm productivity and preserve soil fertility, water and air quality, and biodiversity in agricultural operations.
- Support increased farm productivity, improving crop and livestock yields and nutritional quality to meet existing and future global business growth.
- Safeguard the care of farm animals that are an integral part our supply chain.

The company has developed a set of broad-based objectives, with associated initiatives and projects to improve sustainability within their agricultural supply chain. Goals and programs differ by commodity, geography and business relationship. Programs may be implemented by Pepsico where they have a direct relationship with agricultural producers, or through third parties. Their broad environmental objectives for agricultural supply chains are:

- Agrochemical and nutrient management
 - o optimize use of pesticides, nutrients and other agrochemicals
 - support sustainable practices that substitute natural controls for some agrochemicals, foster ecosystem balance, reduce GHG emissions and mitigate crop losses
- Air quality
 - minimize air emissions in farm operations by minimizing crop protection product drift, reducing particular matter and eliminating odors
- Animal care
 - ensure proper practices, including nutritious diets, safe and appropriate living conditions, and medical care
- Energy and GHG management
 - optimize energy use in crop production and field activities, and manage herds and agricultural waste so as to reduce GHG emissions
- Soil conservation and preservation
 - preserve and improve soil health, minimize erosion, and avoid damage from disease, compaction and contamination
- Water management
 - optimize the water footprint of crop and livestock systems, and responsibly manage run-off risks of pollution or contamination of ground or surface water
 - o develop effective water management plans to reduce risk



PepsiCo's SFI may be of particular relevance for Alberta oat, sugar beet and potato producers.

Characterization of Commonalities and Differences between the Selected Sustainable Sourcing Schemes

Characterization by Scheme Type

Of the short-listed 18 schemes, the majority are best characterized as compliance checklist initiatives (Table 3). This category refers to programs involving self or third-party assessment against an established list of desirable attributes or best practices. Specifically, half of the schemes are assigned to this category. In contrast, only one of the schemes (the Canadian Fieldprint Calculator) is assigned solely to the "calculator" category, and two (ISCC/ISCC Plus and ADM's Sustainable Grower Program, which is based on ISCC) to the "certification" category. Two of the programs (the Loblaw "Sourcing with Integrity" program and Costco's animal welfare audits) do not correspond to any of these three general categories. Both General Mills and Kelloggs describe their sustainable sourcing activities as involving a combination of approaches which variously require use of calculators, certification, and compliance checklist approach is clearly the prevalent approach to sustainable sourcing among the reviewed schemes at present.

A common feature across most of the schemes - whether based on compliance checklists, certification, the use of calculators or otherwise is the emphasis on supporting continuous improvement. Depending on the scheme, this improvement might be demonstrated by comparison against an industry benchmark over time, comparison against the performance of one's own farm over time, implementation of risk assessments and reporting on progress with respect to mitigation measures, or demonstration of progress towards best practices. Indeed, the majority of programs and their respective criteria focus on outcomes rather than prescriptive, quantifiable performance levels for specific indicators.



Table 3. Characterization of schemes by type.

	Calculator	Certification Program	Compliance Checklist Initiative	Other	Notes
Canadian Fieldprint Calculator	Х				
SAI FSA 2.0			x		
ISCC and ISCC Plus		х			
PSI			х		
CRSB					not yet determined
CRSC					not yet determined
DSF and Dairy proAction				х	environmental farm plan for environment module
Nestle Supplier Code			x		
Unilever SAC			х		
General Mills	х	Х	Х		combination of approaches employed
Molson-Coors			х		
Loblaw				х	animal welfare (also a participant in several third-party initiatives, but not for considered commodities)
Kelloggs	x	х	х		combination of approaches employed
Sysco			x		
Costco				х	audits for animal welfare
Walmart			x		supplier ranking based on index performance
ADM (Sustainable Growers Program - ISCC)		Х			program details not available, but based on ISCC
Pepsico				x	goals and programs differ by commodity, geography, and business relationship

Criteria and Indicators Employed by the Sustainable Sourcing Schemes

A general scheme structure to describe different sustainable sourcing schemes is the "Principles, Criteria, and Indicators" structure. Principles refer to the general goal to be achieved – for example, sustainable production of agricultural raw materials. Criteria refer to what is required to reach the defined goal. With respect to the goal of sustainable production, criteria might be defined with respect to diverse aspects of producing agricultural raw materials, such as maintaining water and soil quality. Indicators refer to specific measures to assess the extent to which a criterion is being met.



While the schemes selected for analysis generally share common principles, they are quite variable in the extent to which they articulate their respective criteria and indicators. Some are specific to the criteria level only – for example, requiring that farmers achieve the objective of maintaining soil or water quality – whereas others are quite detailed, with specific indicators for various aspects of satisfying a given criterion.

The evaluation of criteria and indicators focused only on those that are specifically applicable to farmlevel production. In some cases, companies may also apply other criteria and indicators elsewhere in the value chain as part of their sustainable sourcing programs (for example, for processors), or participate in initiatives related to commodities not included in this analysis that have their own respective criteria and indicators. For example, as part of their Sourcing with Integrity program, Loblaw sources fisheries and aquaculture products based on the Marine Stewardship Council and Aquaculture Stewardship Council programs, and palm oil based on the Roundtable for Sustainable Palm Oil program. These were not considered here, since they do not apply to specific commodities or activities of interest in Alberta.

A wide variety of farm-relevant criteria and indicators is observed across the 18 schemes (Table 4). In general, there is considerable variability in the terminology used to describe otherwise similar criteria and indicators, as well as variation in the actual indicators employed. Some schemes employ quite comprehensive indicator suites for some or all criteria, whereas others may have much smaller indicator suites, or list criteria only with no supporting indicators. For example, different schemes may have quite different indicator requirements regarding demonstrating compliance with the criterion of maintaining soil quality. Depending on the scheme, these may include implementation of measures to prevent soil erosion by wind or water, soil compaction, loss of soil organic matter, maintenance of soil nutrients and microbial activity, prevention of soil pollution, on-going measurements of soil health indicators, etc. Such heterogeneity in methods and terminology in life cycle-based environmental accountancy, and the potential burdens this creates for industry, was a key motivating factor behind on-going methodological harmonization efforts internationally. It is likely (and desirable) that similar harmonization efforts will occur for sustainable sourcing programs with respect to terminology and requirements related to criteria and indicators. Indeed, industry-led multi-stakeholder initiatives like the CRSB and CRSC are, in part, motivated by this need.

For the sake of comparability, indicators relevant to overarching criteria (for example, "soil management") were grouped under common criteria headings wherever possible. Following characterization of criteria use by scheme, it was then possible to assess commonalities and differences in those used by the different schemes.

A total of twelve overarching criteria for environmental sustainability concerns were identified, as well as additional criteria for animal health and welfare and socio-economic indicators. The number of environmental criteria of relevance at the farm level for the commodities of concern that are employed by different schemes varied from none to as many as nine of the twelve criteria. The majority of the currently operational schemes apply at least half of these 12 criteria.



There is considerable consistency with respect to usage of a core suite of criteria. Specifically, these are: Water Management; Energy Use/Efficiency; Climate; Soil Management; Biodiversity Conservation/Enhancement; Waste Management; Crop Protection Management; and Nutrient Management. Indicators specific to Air Quality, Natural Resources Management, Land Use, and Pollinator Protection were much less prevalent. Notably, indicators for Animal Health and Welfare as well as a variety of socio-economic indicators were also applied in a large number of the schemes.

A general observation here is that farmers will be better enabled to satisfy the requirements of specific sustainable sourcing schemes having clear descriptions of criteria and indicators, and specific guidance with respect to the practices which will enable satisfactory indicator performance. Schemes such as Unilever's SAC are very detailed both in terms of requirements (outcomes) that must be satisfied for each indicator. Here, the demands on farmers are certainly high in terms of the set of requirements that must be met. At the same time, clarity with respect to required outcomes means that undertaking to achieve compliance is simplified. This is quite different from those schemes with very general ambitions regarding improving sustainability outcomes but little in the way of specific requirements. Difficulties with respect to how to satisfy vague requirements may well hinder both the efficacy of the scheme and the capacity of farmers to demonstrate compliance.



Table 4. Criteria employed by the selected schemes.

	Water Management	Energy Use/Efficiency	Climate	Soil Management	Biodiversity Conservation/Enhancement	Waste Management	Crop Protection Management	Nutrient Management	Air Quality	Natural Resources Management	Land Use	Pollinator Protection	TOTAL ENVIRONMENTAL CRITERIA	Animal Health and Welfare	Socio-economic Indicators
Canadian Fieldprint Calculator		х	х	х							х		4		
SAI	х	х	х	х	х	х	х	х	х				9		
ISCC and ISCC Plus	х	х	х	х	х		х	х					7		x
PSI	х	х		х	х	х	х	х				х	8		
CRSB	х	х	х	х	х	x	х		х				8	х	x
DSF and Dairy proAction	х		х	х	х	х	х	х					7	х	х
Nestle Supplier Code	х	х	х	х	х	х	х						7	х	x
Unilever SAC	х	х		х	х	х	х	х					7	х	х
General Mills	х	х	х	х	х			х					6	х	x
Molson-Coors	х	х			х	х			х	х			6		х
Loblaw														х	
Kelloggs	х	х	х			х	х				х		6		х
Sysco	х	х				х	х						4	х	x
Costco														х	
Walmart	х	х	х			х				х			5		х
ADM (Sustainable Growers Program - ISCC)	х		x	х	x		x	x					6		x
Pepsico	х	х	х	х	х	х	х	х	х				9	х	x
Frequency of Criteria Use	1 4	1 3	1 1	1 1	1 1	1 1	1 0	8	3	2	2	1		9	1 2

It should be noted that numerous indicators are associated with the criteria employed by the selected schemes. Some schemes, such as the Potato Sustainability Initiative, provide detailed indicators for each criteria, whereas other schemes provide few (if any) specific indicators. The following section lists some of the indicators variously associated with the eight criteria that are most commonly employed among the selected schemes. Only those indicators that are employed by at least two of the schemes are listed.



Again, although the specific indicators employed by each scheme may be described using slightly different terms/language, they are grouped where possible.

One common feature across many of the schemes and criteria is the requirement for detailed management plans and records. This is particularly true for the criteria Water Management and Biodiversity Conservation/Enhancement. Also of note is that certain criteria (for example, Water Management, Soil Management, and Crop Protection Management) tend to have either large indicator suites for a given scheme, or high diversity of indicators among schemes. In contrast, the number and/or diversity of indicators for some of other criteria (for example, Energy Use/Efficiency and Waste Management) are much smaller.

Water Management (n=14)

- management plans and records (n=8)
- water use reduction strategies and targets (n=6)
- risk assessment and mitigation strategies (n=3)
- use of optimized irrigation methods (n=2)
- monitoring irrigation system efficiency (n=3)
- irrigation system maintenance (n=2)
- basis for scheduling irrigation (n=2)
- avoidance of over-extraction (n=2)
- avoidance of water pollution (n=2)
- prevention of run-off (n=2)

Energy Use/Efficiency (n=13)

- management plans and records (n=3)
- energy use reduction strategies and targets (n=4)

Climate (n=11)

- measures to identify, measure, monitor and report GHG emissions (n=2)
- setting GHG reduction targets (n=2)
- avoidance of production on land with high carbon stocks (n=2)
- types and amounts of fertilizers, pesticides and energy used (n=2)

Soil Management (n=11)

- management plans and records (n=3)
- soil health (n=2)
- soil sampling and monitoring (pH, SOM, salinity, nutrients, heavy metals) (n=3)
- soil organic matter and structure (n=3)
- compaction monitoring and mitigation (n=4)
- avoidance of erosion (n=2)



- crop choice suitable to soil conditions (n=2)
- avoidance of chemical degradation (n=2)
- avoidance of contamination (n=3)

Biodiversity Conservation/Enhancement (n=11)

- management plans and records (n=5)
- non-disturbance of natural areas (n=2)
- justifications for land conversion (n=2)

Waste Management (n=11)

• recycling, reuse and reduction strategies and targets (n=6)

Crop Protection Management (n=10)

- management plans and records (n=3)
- risk assessments and mitigation measures (n=2)
- procedures to deal with spills (n=2)
- training in and use of IPM (n=5)
- demonstrable necessity of CPP use and amounts (n=3)
- strategies to reduce quantity and toxicity of CPPs used (n=2)
- targeted CPP application (n=3)
- prevention of pest resistance (n=2)
- use of cultural control methods (n=2)
- pest/disease scouting, sampling and monitoring (n=2)
- responsible container disposal (n=3)

Nutrient Management (n=8)

- management plans and records (n=3)
- soil nutrient sampling as basis for application (n=2)
- use/composition of treated/untreated sewage or sludge (n=3)
- responsible storage (n=2)

Audit/Verification Requirements of the Sustainable Sourcing Schemes

Information regarding the verification and audit requirements of the considered schemes was, in general, limited (Table 5). Some schemes, such as the ISCC system and Unilever's Sustainable Agriculture Code, do provide detailed information regarding requirements and processes. For example, the ISCC website describes in detail the steps that an applicant for certification must follow (see ISCC summary section), including the accreditation requirements for the third-party certifying body that the applicant must contract with. Similarly, information available on the Unilever website details procedures that



processors must follow in order to verify compliance of their raw material supply chains, including specific numbers and procedures required for random sample audit and verification activities. In contrast, available literature describing several of the schemes indicates only that suppliers must verify compliance of their supply chains against the (often very general) requirements of the company's code/program. For a number of the other schemes considered, no mention whatsoever of verification/audit was identified in the publically available information that was accessed for assessment. Audit/verification protocols are currently under development for some of the initiatives such as the Canadian Roundtable on Sustainable Beef and the Canadian Round Table on Sustainable Crops.

For some of the schemes – in particular third party or multi stakeholder initiatives such as the Canadian Fieldprint Calculator and the Potato Sustainability Initiative – specific audit requirements/procedures are not in place, but rather would likely be at the discretion of the end user. For example, in the case of the Potato Sustainability Initiative, farmers are able to communicate their results directly to specific customers, and associated audit/verification requirements would be at the customers discretion and in accordance with their own sustainable sourcing policies and procedures. McCain's, for example, uses both CanadaGAP and the PSI, with supporting audits, in their McCainGAP program form sourcing potatoes. Finally, where companies such as retailers employ multiple third-party schemes (for example, Loblaw), verification and audit requirements will likely vary by scheme.

	Verification/Audit Requirements
Canadian Fieldprint Calculator	not currently applicable
SAI	first or third party audits at discretion of customer
ISCC and ISCC Plus	requires certification by an accredited third-party body, including an audit by this body
PSI	verification/audit is not an explicit program requirement - likely at discretion of customer
CRSB	under development
CRSC	under development
DSF and Dairy proAction	third-party audit will be required
Nestle Supplier Code	suppliers must verify that sub-tier suppliers, including producers, satisfy the Code requirements
Unilever SAC	suppliers must verify that sub-tier suppliers, including producers, satisfy the Code requirements as per the Unilever Scheme Rules - random sample chosen for self-assessment, followed by random sample spot-audits by an independent verification body
General Mills	no publically available information was located – likely depends on specific activity
Molson-Coors	supplier identified to represent high risk potential may be audited at the supplier's expense

Table 5. Characterization of scheme audit/verification requirements.



Kelloggs	suppliers must verify compliance of their supply chains against the Supplier Code of Conduct and allow Kellogg or an authorized third party to conduct audits to verify compliance
Sysco	requires animal welfare and quality assurance audits, with follow-up audits to ensure improvement plans are implemented
Costco	may conduct animal welfare audits
Walmart	no publically available information was located
ADM (Sustainable Growers	audit by ADM and, potentially, third-party audit
Program - ISCC)	
Pepsico	no publically available information was located



Assessment results for the "accessibility" of the selected sustainable sourcing schemes A subset (i.e. those for which sufficient information was available for some or all of the criteria) of the eighteen sustainability schemes that were selected for analysis were each evaluated against a matrix of criteria for accessibility. Accessibility refers to the extent to which farmer participation in the scheme will likely be enabled by various scheme characteristics. Criteria include, for example: the clarity of purpose of the scheme; the ease of implementation (including the availability of supporting information, guidance documents, and/or calculation tools); and the cost of implementation. This assessment was based on a review of the publically available documents that were identified via internet searches – in particular, the material available on the websites of the scheme owners. The review was largely qualitative, and, given the short timelines for this project, scheme operators were not contacted for verification of the analysis. Rather, **the scoring reflects the reviewer's judgment of the scheme characteristics relative to best available approaches for each sub-criterion vis-à-vis the other schemes, based on the publically available information that was accessed for the analysis. Error! Reference source not found.** presents the ranked scores for accessibility for each scheme. Detailed scores by criterion for each of the evaluated schemes are provided in Appendix A.

The schemes generally provide clear information regarding their purpose and applicability, but are quite inconsistent with respect to the level of guidance that is provided to support implementation of scheme requirements. Some are very detailed – for example, the on-line Potato Sustainability Initiative survey provides pop-up style guidance for specific questions. Others, however, provide very little indication as to how farmers are expected to meet the stated requirements, whether these are specific or general in nature.

Overall, the schemes should be quite accessible to farmers, as the indicators and requirements largely refer to subject areas and practices with which farmers will be intimately familiar. Schemes requiring greenhouse gas emissions assessments, soil sampling techniques, or other assessment activities not previously undertaken by a farmer may prove challenging and hence necessitate third-party assistance.

The data requirements for the schemes can likely be met, as most refer to information/records regarding the farmers own practices. Indicators related to biodiversity, or GHG emissions calculations requiring use of emission factors may potentially be more challenging to satisfy.

A number of the schemes have their own calculation tools, while others make use of third-party calculators (tools developed by multi-stakeholder initiatives of which they are part). Such calculators are typically developed to be quite user friendly, hence their availability is certainly advantageous to support satisfaction of indicators such as greenhouse gas emissions calculations.

Only one of the schemes reviewed (ISCC) has direct associated costs for farmers, in the form of fees to hire an accredited certification body for the certification process. Molson-Coors also states, however, that high-risk suppliers may be audited at their own cost. Outside of these direct audit/verification costs,



burdens on farmers will largely related to the time required to demonstrate compliance, as well as costs associated with developing the required management systems, infrastructure, and modified practices. These costs will be largely context-dependent, hence it is not possible to make meaningful estimations regarding cost levels for these variables in the context of the current analysis.

Only a subset of the schemes indicate that verification/audit procedures are necessary. Where such requirements exist, the level of detail provided is quite variable. Both Unilever and ISCC provide quite detailed information, whereas other schemes provide only general statements only such as "suppliers must verify compliance of their supply chains."

As a general observation, multi-stakeholder schemes achieved higher accessibility scores than did most private company schemes.



Figure 1. "Accessibility" scores (ranked from highest to lowest) for a subset of each of the reviewed sustainable sourcing schemes.

Summary of Some Key Commonalities and Differences among the Selected Schemes The selected schemes evince a variety of commonalities and differences (Table 6). One of the more common features is scheme type, with most schemes corresponding to the "compliance checklist" type. Here, participants are typically required to demonstrate compliance with respect to lists of desired outcomes or best practices. Calculators and certification programs are seemingly much less common – at least among schemes of highest potential relevance for Alberta farmers.

There was a fairly even distribution between multi-stakeholder versus private company initiatives. With the exception of the Unilever initiative, the multi-stakeholder schemes generally appear to be more



comprehensive and detailed than the in-house initiatives of private companies. Industry-led, multistakeholder initiatives such as the CRSC and CRSB may ultimately prove among the most successful of these schemes in light of the ground-up buy-in that is achieved through consensus-based, roundtable processes. They may also be less prone to charges of "green-washing" or general skepticism due to the range of stakeholder interests that are represented during their development.

Almost all of the selected schemes refer to multiple criteria and indicators. There is a large range in the number of criteria and supporting indicators applied by different among the schemes. However, a common set of criteria is observed in the majority of schemes, specifically: Water Management; Energy Use/Efficiency; Climate; Soil Management; Biodiversity Conservation/Enhancement; Waste Management; Crop Protection Management; and Nutrient Management. Animal Health and Welfare, along with a variety of socio-economic indicators, are also represented in most schemes, although these were not considered in detail in the current analysis.

At present, there is seemingly little consistency in the specific indicators that are employed to assess performance against many of the criteria. Indicators for criteria such as crop protection management, soil management, and nutrient management are particularly diverse. This is less the case for indicators related to Waste Management, Energy Use/Efficiency, and Biodiversity Conservation/Enhancement. There is also inconsistency in the level of detail that schemes provide with respect to how to demonstrate compliance with indicators and criteria. A common feature across many of the schemes is the requirement for management plans and records for several of the criteria.

Few of the schemes provide detailed information regarding verification/audit requirements, and some make no mention of such requirements. The absence of clear requirements – both in terms of criteria/indicators and verification/audit – may present a non-trivial stumbling block to enabling farmer success in meeting scheme requirements.

One very common feature among the selected schemes is the emphasis on continuous improvement, although the basis for demonstrating continuous improvement may vary. Overall, the focus appears to be on outcomes and best management practices rather than establishing prescriptive, quantitative performance requirements. Requirements related to the development and implementation of management plans, risk assessments, and mitigation strategies are common to many of the schemes.

Most of the private sector initiatives are currently focused on their priority raw materials, with concrete targets regarding sustainable sourcing volumes and dates. Although very little information was identified suggesting that Alberta production systems are currently on the radar of these programs, many of the priority raw materials do correspond to the list of priority Alberta commodities that were identified for consideration in this study. This is similarly true of the multi-stakeholder initiatives. The Canadian initiatives (CRSC and CRSB) as well as the Canadian Fieldprint Calculator will clearly be of direct relevance for Albertan producers. With respect to livestock products, it is notable that few schemes


currently consider the environmental sustainability dimensions of livestock products, but tend to focus rather on animal health and welfare considerations.



Table 6. Summary of key commonalities and differences among the selected schemes.

	Program Type	Operator	Stakeholder Representation	Multi- criteria	Verification/ Audit	Continuous Improvement	Relevant Target Commodities
Canadian Fieldprint Calculator	calculator	Serecon	Yes	Yes		Yes	field crops
SAI FSA 2.0	checklist compliance	SAI Platform	Yes	Yes	Maybe	Yes	all crops, sugar beets
ISCC and ISCC Plus	certification	ISCC Association	Yes	Yes	Yes		all crops, canola
PSI	checklist compliance	industry consortium	Yes	Yes	Maybe	Yes	potatoes
CRSB	not yet determined	CRSB Council	Yes	Yes	Being developed	Yes	beef
CRSC	not yet determined	CRSC Steering Committee	Yes	Yes	Being developed	Yes	field crops
DSF and Dairy proAction	Environmental Farm Plan	Dairy Farmers of Canada		Yes	Yes	Yes	dairy
Nestle Supplier Code	checklist compliance	Nestle	private	Yes	Yes	Yes	sugar, dairy, meat, poultry and eggs
Unilever SAC	checklist compliance	Unilever	private	Yes	Yes	Yes	sugar, canola oil, dairy and eggs; working on wheat in US
General Mills	multiple types	General Mills	private	Yes		Yes	oats, wheat, sugar beet, as well as other crops in rotation (lentils, peas, canola, potatoes)
Molson-Coors	checklist compliance	Molson-Coors	private	Yes	Maybe	Yes	barley
Loblaw Sourcing with Integrity	multiple types	Loblaw	private	Animal welfare	Maybe	Yes	eggs and pork
Kelloggs	multiple types	Kelloggs	private	Yes	Yes	Yes	wheat, oats, potatoes and sugar beets
Sysco	checklist compliance	Sysco	private	Yes	Yes	Yes	potatoes, livestock products
Costco	animal welfare audits	Costco	private	Animal welfare	Maybe		livestock products



9.0.00	9.0				<u> </u>		
Walmart Sustainability Index and Sustainability Consortium	checklist compliance	Walmart/Sustainability Consortium	Yes	Yes		Yes	all products; TSC Toolkits available for beef, chicken, eggs, pork, grains, barley and malt, sugar, beans/lentils/peas and potatoes
ADM (Sustainable Growers Program - ISCC)	certification	ADM	private	Yes	Yes		canola, but potentially other raw materials also
Pepsico	multiple types	Pepsico	private	Yes		Yes	oat, sugar and potatoes



Companies/schemes making direct sustainable sourcing reference to the shortlist of Alberta commodities are described in Table 7. Most of the commodities are referred to by at least five of the schemes. Canola, oats, sugar beets, potatos and milk are referred to most frequently. Tame hay, barley, peas, and chicken are referred to least frequently among the schemes considered in this analysis.

Commodity	CFC	SAI	ISCC	PSI	CRSB	CRSC	DSF	Ν	U	GM	MC	L	К	S	С	W	ADM	Ρ	#
Wheat	х					х				Х			х			Х			5
Canola	х		х			х			х	х							х		6
Tame Hay																			0
Barley	х					х					х					х			4
Peas	х					х				х									3
Oats	х					х				х			х			х		х	6
Sugar Beets		х						х	х	х			х			х		х	7
Potatoes				х						х			х	х		х		х	6
Beef					х							x ¹		х	х	х			5
Pork								х				х		х	х	х			5
Chicken								х						х	х	х			4
Eggs								х	х					х	х	х			5
Milk							х	х	х					х	х	х			6

Table 7. Sustainable sourcing programs that refer to priority Alberta commodities.

note: CFC = Canadian Fieldprint Calculator, SAI = Sustainable Agriculture Initiative Farm Sustainability Assessment Tool 2.0, ISCC = International Sustainability and Carbon Certification (and ISCC Plus), PSI = Potato Sustainability Initiative, CRSB = Canadian Roundtable on Sustainable Beef, CRSC = Canadian Round Table on Sustainable Crops, DSF = Dairy Sustainability Framework and Dairy proAction, N = Nestle Supplier Code, U = Unilever Sustainable Agriculture Initiative, GM = General Mills, MC = Molson-Coors Supplier Code and Agricultural Brewing Ingredients Policy, L = Loblaw Sourcing with Integrity, K = Kelloggs Supplier Code, S = Sysco, C = Costco, W = Walmart Sustainability Index and the Sustainability Consortium Product Toolkits, ADM = Archer Daniels Midland Sustainable Grower's Program, P = Pepsico Supplier Code and Sustainable Farming Initiative

(1) Loblaw is currently involved in the McDonald's pilot project on sourcing verified sustainable beef

Conclusions

Sustainable sourcing is clearly a subject of increasing relevance in the agri-food marketplace. Numerous private company and multi-stakeholder initiatives have emerged. These initiatives take a variety of approaches and foci in pursuit of leveraging improved sustainability performance along supply chains. Also important as motivators for such initiatives are the market access and social license opportunities for participants.

In Canada, several large-scale, multi-stakeholder initiatives in support of developing methods, criteria, indicators and tools to support sustainable sourcing of specific commodities are in progress. Numerous food sector companies operating in Canada also have in-house sustainable sourcing programs, and several pilot projects are underway. Internationally, there also initiatives such as SAI and ISCC that may be or are being actively implemented in Canada.



Overall, however, the actual degree of sustainable sourcing activity that is placing direct demands on Albertan farmers (outside of animal welfare audits) appears to be quite limited at present. Whereas sustainable sourcing may be relatively advanced in Europe, the US or elsewhere, actual implementation of such activities in Canada is seemingly lagging. Nonetheless, stakeholders throughout the Canadian food system are well aware of the increasing relevance of sustainable sourcing for agri-food products, and the inevitability of implementation of related programs in Canada over time.

The sustainable sourcing initiatives that were selected for analysis in this study encompass a heterogeneous set of activities, and are quite variable in both scope and specificity. Some common features are in evidence, including the nature of such schemes (typically based on a compliance checklist approach), the set of environmental criteria that are most common among them (Water Management; Energy Use/Efficiency; Climate; Soil Management; Biodiversity Conservation/Enhancement; Waste Management; Crop Protection Management; and Nutrient Management), and a general emphasis on continuous improvement rather than prescriptive performance levels. They are, however, quite variable in terms of indicator use and specificity for demonstrating compliance with environmental criteria. Details regarding verification/audit requirements, if any, are also generally quite thin as well as inconsistent between schemes. At present, some schemes will likely be much more accessible for farmers than others.

Taken together, these observations suggest considerable scope for maturation for most of the initiatives evaluated, as well as the clear desirability of harmonization among initiatives. In general, the feasibility and efficacy of sustainable sourcing will be strongly influenced by the extent to which farmers are enabled to participate. This requires clarity and consistency in requirements, verification/audit mechanisms, and avoidance of duplication and overburden resulting from farmers having to grapple with multiple, heterogeneous schemes.



Appendix A. Detailed Evaluation Results for the Accessibility of the Program/Activity

Canadian Fieldprint Calculator

PROGRAM/ACTIVITY: CANADIAN FIELDPRINT CAI	CULATOR				
ACCESSIBILITY					
Evaluation Criteria		Score			
The program/activity		NA	Does not satisfy the criterion (weight = 0)	Somewhat satisfies the criterion (weight = 1)	Satisfies the criterion (weight = 2)
(1) provides clear information as to its purpose and applicability					x
(2) provides clear guidance documents/material in support of its implementation	currently being developed	x			
(3) is accessible to a non-expert audience	calculator is user friendly				x
(4) requires data that are reasonably accessible					x
(5) has supporting tools/software or other materials that facilitate its implementation					x
(6) does not have high implementation costs					x
(7) has clear verification/audit procedures and requirements		x			
Totals					10
Weighted Accessibility Score			10/10 = 10	0%	



Sustainable Agriculture Initiative Farm Sustainability Assessment 2.0

PROGRAM/ACTIVITY: SAI Farm Sustainability As	sessment 2.0				
ACCESSIBILITY					
Evaluation Criteria		Score			
The program/activity		NA	Does not satisfy the criterion (weight = 0)	Somewhat satisfies the criterion (weight = 1)	Satisfies the criterion (weight = 2)
(1) provides clear information as to its purpose and applicability	detailed website and publication				x
(2) provides clear guidance documents/material in support of its implementation	limited guidance provided in tool itself		x		
(3) is accessible to a non-expert audience					x
(4) requires data that are reasonably accessible	farmer's own data				x
(5) has supporting tools/software or other materials that facilitate its implementation	online or downloadable Excel- based tool				x
(6) does not have high implementation costs	free				x
(7) has clear verification/audit procedures and requirements	at discretion of customer, hence may vary	x			
Totals		1	1		5
Weighted Accessibility Score			10/12 = 839	%	



ISCC/ISCC Plus

PROGRAM/ACTIVITY: ISCC and ISCC Plus					
ACCESSIBILITY					
Evaluation Criteria		Score			
The program/activity		NA	Does not satisfy the criterion (weight = 0)	Somewhat satisfies the criterion (weight = 1)	Satisfies the criterion (weight = 2)
(1) provides clear information as to its purpose and applicability	detailed website and publications				x
(2) provides clear guidance documents/material in support of its implementation	Annexes to standards specify requirements and certification process				x
(3) is accessible to a non-expert audience					x
(4) requires data that are reasonably accessible	farmers own data, detailed records, emission factors			x	
(5) has supporting tools/software that facilitate its implementation		x			
(6) does not have high implementation costs	costs associated with hiring certifier			x	
(7) has clear verification/audit procedures and requirements	detailed guidance provided re. process, requires contracting				x



	an accredited				
	certification body				
Totals		1		2	4
Weighted Accessibility Score			10/12 - 83%		

Potato Sustainability Initiative

PROGRAM/ACTIVITY: POTATO SUSTAINABILITY I	NITIATIVE (PSI)					
ACCESSIBILITY						
Evaluation Criteria		Score				
The program/activity		NA	Does not satisfy the criterion (weight = 0)	Somewhat satisfies the criterion (weight = 1)	Satisfies the criterion (weight = 2)	
(1) provides clear information as to its purpose and applicability	website hosting the PSI survey does not provide many details			x		
(2) provides clear guidance documents/material in support of its implementation	on-line survey questions have linked supporting information				x	
(3) is accessible to a non-expert audience					x	
(4) requires data that are reasonably accessible					x	
(5) has supporting tools/software or other materials that facilitate its implementation	on-line survey				x	
(6) does not have high implementation costs	free				x	



may be at customers				
discretion, hence	x			
may vary				
	1		1	5
		11/12 = 92%		
	discretion, hence may vary	discretion, hence x may vary 1	iscretion, hence x may vary 1 1 11/12 = 929	iscretion, hence x may vary 1 1 11/12 = 92%

Nestle Supplier Code and Responsible Sourcing Guideline

PROGRAM/ACTIVITY: Nestle Supplier Code and Responsible Sourcing Guideline							
ACCESSIBILITY							
Evaluation Criteria		Score					
The program/activity		NA	Does not satisfy the criterion (weight = 0)	Somewhat satisfies the criterion (weight = 1)	Satisfies the criterion (weight = 2)		
(1) provides clear information as to its purpose and applicability	detailed information on Nestle website				x		
(2) provides clear guidance documents in support of its implementation	many general requirements, but specific guidance was not identified			x			
(3) is accessible to a non-expert audience	since specific guidance is limited, non-experts may require support				x		





(4) requires data that are reasonably accessible	appears to be largely farmers own data			x
(5) has supporting tools/software or other materials that facilitate its implementation		х		
(6) does not have high implementation costs				x
(7) has clear verification/audit procedures and requirements	website states only that first or third- party audits may be implemented	x		
Totals		2	1	4
Weighted Accessibility Score		9/14 = 64%	-	

Unilever Sustainable Agriculture Code

PROGRAM/ACTIVITY: UNILEVER SAC					
ACCESSIBILITY					
Evaluation Criteria		Score			
The program/activity		NA	Does not satisfy the criterion (weight = 0)	Somewhat satisfies the criterion (weight = 1)	Satisfies the criterion (weight = 2)
(1) provides clear information as to its purpose and applicability	detailed information on website				x
(2) provides clear guidance documents in support of its implementation	limited technical guidance, but indicators are quite clear			x	
(3) is accessible to a non-expert audience					x





(4) requires data that are reasonably accessible	farmers own data			x
(5) has supporting tools/software or other materials that facilitate its implementation	Greenlights software on Muddy Boots platform			x
(6) does not have high implementation costs	not directly for farmers (although probably time- intensive), but likely costly for processors to audit suppliers			x
(7) has clear verification/audit procedures and requirements	audit details described on website			x
Totals			1	6
Weighted Accessibility Score		13/14 = 939	%	

Molson Coors Supplier Code and Agricultural Brewing Ingredients Policy

PROGRAM/ACTIVITY: MOLSON COORS SUPPLIEF	CODE				
ACCESSIBILITY					
Evaluation Criteria		Score			
The program/activity		NA	Does not satisfy the criterion (weight = 0)	Somewhat satisfies the criterion (weight = 1)	Satisfies the criterion (weight = 2)
(1) provides clear information as to its purpose and applicability	detailed material on company website				x
(2) provides clear guidance documents in support of its implementation	quite general requirements in Code, but the			x	



	company provides guidance to suppliers to enable improvements			
	improvements			
(3) is accessible to a non-expert audience				x
(4) requires data that are reasonably accessible				x
(5) has supporting tools/software or other materials that facilitate its implementation	material to be provided by company as appropriate		x	
(6) does not have high implementation costs				x
(7) has clear verification/audit procedures and requirements	states only that high risk suppliers may be audited at own cost	x		
Totals		1	2	4
Weighted Accessibility Score		10/14 = 719	%	

Kelloggs Supplier Code

PROGRAM/ACTIVITY: KELLOGGS SUPPLIER CODE	OF CONDUCT				
ACCESSIBILITY					
Evaluation Criteria		Score			
The program/activity		NA	Does not satisfy the criterion (weight = 0)	Somewhat satisfies the criterion (weight = 1)	Satisfies the criterion (weight = 2)
(1) provides clear information as to its purpose and applicability	detailed information on website				x



(2) provides clear guidance documents in support of its implementation	Code is quite general, little specific information was identified	x		
(3) is accessible to a non-expert audience				x
(4) requires data that are reasonably accessible				x
(5) has supporting tools/software or other materials that facilitate its implementation	may use existing programs like Fieldprint Calculator in US			x
(6) does not have high implementation costs				x
(7) has clear verification/audit procedures and requirements	states only that suppliers must verify compliance of supply chain against the Code		x	
Totals		1	1	5
Weighted Accessibility Score		11/14 = 799	%	

Sysco Supplier Code and Related Measures

PROGRAM/ACTIVITY: SYSCO SUPPLIER CODE OF CONDUCT AND RELATED SPECIFIC MEASURES						
ACCESSIBILITY						
Evaluation Criteria		Score				
The program/activity		NA	Does not satisfy the criterion	Somewhat satisfies the criterion	Satisfies the criterion	



		(weight = 0)	(weight = 1)	(weight = 2)
(1) provides clear information as to its purpose and applicability	detailed information on website			x
(2) provides clear guidance documents in support of its implementation	good guidance with respect to some required measures		x	
(3) is accessible to a non-expert audience				x
(4) requires data that are reasonably accessible				x
(5) has supporting tools/software or other materials that facilitate its implementation		x		
(6) does not have high implementation costs				x
(7) has clear verification/audit procedures and requirements	states only that suppliers must allow unannounced animal welfare and quality assurance audits	x		
Totals		2	1	4
Weighted Accessibility Score		9/14 = 64%		

Walmart Sustainability Index and The Sustainability Consortium

PROGRAM/ACTIVITY: WALMART SUSTAINABILITY INDEX (AND SUSTAINABILITY CONSORTIUM PRODUCT TOOLKITS)					
ACCESSIBILITY					
Evaluation Criteria		Score			



The program/activity		NA	Does not satisfy the criterion (weight = 0)	Somewhat satisfies the criterion (weight = 1)	Satisfies the criterion (weight = 2)
(1) provides clear information as to its purpose and applicability					x
(2) provides clear guidance documents in support of its implementation	Index is fairly straight-forward. Environmental requirements clear only if linked to existing third-part sustainable sourcing program or implementing TSC Toolkits			x	
(3) is accessible to a non-expert audience					x
(4) requires data that are reasonably accessible					x
(5) has supporting tools/software or other materials that facilitate its implementation	TSC material provides good guidance if used			x	
(6) does not have high implementation costs					x
(7) has clear verification/audit procedures and requirements	no requirements/details were identified	x			
Totals		1		2	4
Weighted Accessibility Score			10/12 = 839	%	

Pepsico Supplier Code and Sustainable Farming Initiative

PROGRAM/ACTIVITY: PEPSICO SUSTAINABLE FARMING INITIATIVE AND SUPPLIER CODE



ACCESSIBILITY					
Evaluation Criteria		Score			
The program/activity		NA	Does not satisfy the criterion (weight = 0)	Somewhat satisfies the criterion (weight = 1)	Satisfies the criterion (weight = 2)
(1) provides clear information as to its purpose and applicability					x
(2) provides clear guidance documents in support of its implementation	Code provides very general statement regarding environmental performance, and guidance elsewhere is also quite general.			x	
(3) is accessible to a non-expert audience					x
(4) requires data that are reasonably accessible					x
(5) has supporting tools/software or other materials that facilitate its implementation	supporting materials were not identified		x		
(6) does not have high implementation costs					x
(7) has clear verification/audit procedures and requirements	states only that adherence to the Code requires cooperating with reasonable assessment processes		x		
Totals			2	1	4
Weighted Accessibility Score			9/14 = 64%		



Appendix B. About Nathan Pelletier and Global Ecologic

Understanding and managing the environmental and social costs and benefits of economic activity has become a defining challenge of the modern era. This challenge provides the nucleus for the rapidly evolving field of sustainability measurement and management. Nathan Pelletier, principal of Global Ecologic, is an independent sustainability consultant specializing in environmental and social performance measurement and management strategies in food and other industrial systems. His work proceeds from the recognition that sustainability is the first principle of responsible management, whether at the level of private enterprise, regional, national or global governance.

Pelletier works closely with clients to build an understanding of supply chain environmental and social sustainability performance and mitigation opportunities using a variety of cutting edge modeling frameworks. These include environmental and social life cycle assessment, environmental footprinting, supply-chain greenhouse gas accounting, energy analysis, and ecological footprint analysis. He is dedicated to delivering high-quality, cost-effective consulting services to meet the demands of citizens, firms and organizations committed to furthering sustainability objectives.

Pelletier established Global Ecologic in 2006. He has since continued to expand his broad experience base in food system sustainability consulting services, working with a variety of small and large organizations to further their sustainability initiatives both at home and abroad. Having researched and modeled over 150 agricultural crop, animal husbandry, fisheries and aquaculture production, processing and distribution supply chains using ISO 14044-compliant life cycle assessment (LCA), Pelletier is recognized as an international expert in LCA of food systems, and a leader in the field. Examples of recent and on-going consulting projects include:

- evaluation of the social license and market access implications of sustainable sourcing schemes for Alberta Agriculture and Forestry
- review of LCA studies for ISO 14044 compliance for various private and public sector bodies
- social and environmental life cycle assessment of the Canadian egg industry, including assessment of alternative housing technologies, for Egg Farmers of Canada
- life cycle assessment of greenhouse gas emissions for egg production and processing supply chains in the United States for the American Egg Board
- comparative life cycle assessment of the environmental performance (including GHG emissions) of the US national egg sector in 1960 and 2010 for the American Egg Board, Egg Industry Council, and United Egg Producers
- development of a supply chain ecological footprint and greenhouse gas accounting tool incorporating LCA-based models of agricultural, fisheries and animal husbandry product supply



chains for a major international aquafeeds company (EWOS) to facilitate least-environmentalcost feed sourcing (seven projects since 2006)

- life cycle assessment of tilapia aquaculture production in lake and pond-based systems, including processing and transportation to market ports for the leading global tilapia producer, Regal Springs
- development of a supply chain greenhouse gas accounting tool for SeaFish Industry Authority (UK) for profiling high-volume seafood supply chains
- Provision of food product greenhouse gas emissions intensity data for Bon Appétit Management Foundation Company (Compass Food Service), to be used in educating their institutional chefs as well as their on-line food product GHG calculator as part of the Low Carbon Diet Initiative

Pelletier has similarly constructed and published LCA models of US national broiler poultry production, high and low-profitability conventional and niche swine operations in the mid-western United States, as well as three competing mid-western beef production technologies. All of these models are constructed using an ISO 14044-compliant LCA modelling platform developed by Pelletier for the purpose of high-resolution analyses of crop and animal husbandry systems. This includes customized sub-models based on internationally recognized protocols and best-available scientific practice. Because the platform enables the use of identical modelling principles and parameters for context-specific applications, it ensures direct and robust comparability of model results within and across production systems and technologies.

He also recently developed a macroscale screening-level social LCA using 28 social risk categories for trade-based consumption in the European Union (taking into account flows of internationally traded commodities) for the European Commission Joint Research Centre. This model characterized the social risks attributable to the trade-based consumption patterns of the average EU-27 consumer, as well as for EU-27 trade-based consumption in aggregate.

Pelletier similarly recently completed drafting the life cycle-based European Commission Product and Organization Environmental Footprint methods, which will become the reference methods linked to any voluntary or mandatory applications associated with European Commission policy, as well as the European Sustainability Footprint framework.

