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Redesigning the Canadian Agriculture Statistics Program

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ABSTRACT

A number of converging issues have led to a comprehensive review of the Canadian agriculture statistics program. In 2009 Statistics Canada began a major initiative to transform its corporate business architecture, which will affect all aspects of survey taking. The Agriculture statistics program is included, so its survey program was already under review in preparation for its transition, scheduled for 2015. The program had also been challenged to find ways to further reduce burden on agriculture survey respondents beyond the steps already applied on an ongoing basis (such as reducing sample sizes and questionnaire length, controlling sample overlap, etc.). The discussions that occurred in 2010 surrounding the 2011 Census of Population and the 2011 Census of Agriculture also identified the need to rethink approaches to producing agriculture statistics and led to a decision to combine the various reviews into one overall review of the way the Agriculture statistics program is conducted, including the surveys, the Census of Agriculture, the use of tax filer and other administrative data sources (such as program support information systems) and the use of remote sensing techniques.

This paper will describe the approach taken to the review of the Agriculture statistics program and discuss findings to date. Challenges in using data sources other than direct surveying of agricultural producers, and possible solutions to these challenges, will be presented. The outcome is likely to be a "hybrid" program, where coherent statistics will need to be produced from a mixture of sources including direct surveying, use of taxation data, administrative data (micro and aggregated), and data derived from the interpretation of satellite and other remote sensing sources, with more reliance over time on the latter sources and less on direct surveys. Therefore, an important aspect of this work will be how to balance the approaches and combine the data from them in a sustainable way.

while ensuring the quality of the statistical outputs can be maintained and measured. The paper includes discussion of the thinking to date on these challenges.

Keywords: response burden, non-survey data

1. Introduction

The current Canadian agriculture statistics program provides a wide range of ongoing statistics on many key aspects of agriculture: financial, commodity production and stocks, land use, management practices, and environmental practices, as well as other special topics on an ad hoc basis. Data gathering and dissemination frequencies also vary and range from weekly (updates on crop condition), monthly (e.g., Farm Product Price Index; some supply-managed commodity statistics), quarterly (e.g., hog statistics; farm cash receipts), biannually (e.g., cattle and sheep statistics; farm income statistics; fruit and vegetable statistics), and annually (e.g., greenhouse, statistics; maple statistics). A major data series, the Field Crop Reporting Series, provides information on major and special crops during the growing season on planting intentions, seeded area, harvested area, production, yield and stocks.

Direct surveying of agricultural producers (defined as those engaged in agriculture with an intent to sell the outputs) and agriculture-related businesses (for example grain elevators, other storage facilities, fertilizer manufacturers) is the main method used to collect data from which the statistics are produced, but data from existing administrative sources are used to some extent to supplement or replace direct surveying. Some use is also made of remote sensing to statistics on crop condition and to supplement or provide contextual information for the crop statistics program. There is also a complete enumeration of all agricultural operations, the Census of Agriculture which is currently conducted every 5 years, which collects comprehensive information about the operations and allows, among other things, the publication of extensive small-area agricultural information using standard census geographies, and the ability to provide statistics on a variety of other geographic bases such as watersheds, soil areas, and so on. Traditionally, the Census of Agriculture (with its information about farm business) has been linked with the Census of Population “long form” (with its extensive demographic and social information) in order to produce an extremely rich socio-economic database for the study of issues affecting farmers and their families.

A number of issues and recent initiatives have led to a major review of the Canadian agriculture statistics program. While some of these issues are not new, and while the initiatives were conceived and launched separately, clear inter-relationships have emerged among them and there has been a convergence which has made a major rethinking of the program inevitable. This convergence has also meant that the time available is limited, as many decision points will come in the very near future.

The issues, described more fully below, include: i) Statistics Canada’s Corporate Business Architecture initiative which, over the coming years, will transform the way statistical its programs are conducted, ii) the debates and decisions surrounding the 2011 round of Canadian quinquennial censuses (of population and of agriculture); iii) the growing profile of the response burden issue, both within Statistics Canada and externally; iv) the launching of a new “Red Tape Reduction Commission” in January 2011 aimed at reducing the burden of government compliance on small and medium-sized businesses; v) general budgetary pressures; vi) the launching of the federal government Strategic and Operating Review¹, aimed at eliminating the federal budget deficit by 2014/2015.

¹ Also referred to as the “Deficit Reduction Action Plan.”

Section 2 provides some background on the several initiatives that have prompted the current review of Agriculture statistics program. Following this, Section 3 discusses the overall approach taken to the review and redesign of the program by describing the various steps and their rationale. Section 4 presents the findings of the review up to the time of writing. Flowing from these preliminary findings, a number of challenges have been identified, both statistical and practical in nature, and these are discussed in Section 5. How these challenges might be overcome and the further work that will be required are covered in Section 6. Some concluding thoughts are given in Section 7.

2. Background

In its 2009/2010 to 2011/2012 Corporate Business Plan, Statistics Canada identified two key management priorities for the next five years: its corporate business architecture and human resources (Statistics Canada 2009a). The corporate business architecture initiative, or CBA as it has come to be known, was born from the realization that although Statistics Canada had traditionally been successful in meeting its efficiency goals by focussing at the level of the individual program, increasing financial pressures and decreased capacity for finding further local efficiencies would preclude a continuation of the traditional approach without jeopardizing the quality of statistical outputs. The CBA initiative will review all business processes and systems with the goals of achieving: 5% organizational efficiencies on ongoing operating costs within 5 years; a reduced, unduplicated set of robust systems and processes that are properly documented and maintained; and, improved responsiveness in the delivery of new statistical programs. These objectives are being achieved through a number of projects which have been proposed and approved according to their alignment with CBA principles. Some of these principles include: corporately (rather than locally) optimized decision making; centralization of informatics, statistical processing, methodology support and survey frames; maximize re-use (smallest number of business processes and enabling computer systems); maximize deployment of electronic data reporting solutions; strong information management; focus on the core business of developing, producing and disseminating statistical information; mandatory use of generic corporate services for collection, operations, dissemination, etc.

Several projects have been launched to move the Agriculture statistics program in the CBA direction. One of these involves the centralization of data collection activities for approximately 30 mostly small, specialized surveys where previously some or all of the collection tasks had been performed by Agriculture Division staff. This centralization is taking place over the fiscal years 2010/2011 and 2011/2012.

Another CBA project involves migration of the agriculture list frame, the Farm Register, previously maintained by Agriculture Division, into the Statistics Canada Business Register (BR). To accomplish this, the two frames will be compared and reconciled, some BR systems components will be modified and adapted, the agriculture records will be integrated, and finally the agriculture surveys will be hooked up to the new frame. This project spans three fiscal years from 2010/2011 to 2012/2013.

A third project related to the CBA is examining the possibilities for using information collected by the Canada Revenue Agency for taxation purposes as a substitute for the financial questions asked on the quinquennial Census of Agriculture and the annual Farm Financial Survey. Testing was done in conjunction with the 2009 Census Test to see if agricultural operators would be willing to provide their Business Number which would greatly facilitate matching their operation with the correct tax records (they were), and to assess whether the matching rate would be high enough to allow confident use of

the tax data instead of survey responses (it was). Consequently, the 2011 Census of Agriculture (conducted in May 2011) did collect the Business Number, but continued to also collect financial information. Responses from the census will be compared with the tax data to determine the feasibility of removing the questions from the next Census of Agriculture (scheduled for 2016) and from the Farm Financial Survey (perhaps as early as the 2013 reference year).

The agriculture program is also involved in and affected by the CBA project to create a common business survey data processing environment known as the Integrated Business Statistics Program (IBSP). Currently, most of the larger agriculture surveys are processed (edit and imputation, estimation, analysis, outputs for dissemination) using a system built about 10 years ago and operated in Agriculture Division. The smaller surveys have been processed using other tools such as spreadsheet-based or other local, purpose-built systems. As part of the CBA plans, all business surveys, including agriculture surveys, will move into the common business survey processing environment. This new initiative is a logical evolution to the Unified Enterprise Survey Program launched in the late 1990s, which saw about 60 business surveys (but excluding agriculture and some other domains) adopt common survey collection and processing tools and environments. The IBSP will provide a refreshed and modernized environment for the original UES surveys, and take in many additional ones, more than doubling the number of surveys included. Phase 1 will see the existing UES surveys moved in the IBSP environment. Agriculture surveys are part of IBSP Phase 3, which means being in production starting with reference year 2015. This will require that transition work begin in 2013/2014.

There is also a CBA project dealing with further development and exploitation of electronic data reporting, in particular, electronic questionnaires. Agriculture has some experience on this front, with the Census of Agriculture having offered an Internet response channel in both 2006 and 2011. In 2006, approximately 5% of agricultural operators responded to the Census of Agriculture using the Internet, and for 2011, the projected take up rate was estimated to be 10%, which appears to be achievable². In comparison, the Census of Population received nearly 20% of its returns via the Internet in 2006 and for 2011, it was anticipated that the proportion that would respond by Internet was 40%. There are also two small agriculture surveys which offer Internet response options. These are surveys of businesses holding commercial stocks of special crops, corn or soybeans. The proportion of respondents using the Internet for these surveys is typically in the range of 20-40% (depending on the survey). With additional effort, it is Statistics Canada's hope that responding by Internet will become the predominant collection method for business surveys.

Canada conducts two major censuses, the Census of Population and the Census of Agriculture, each of which is currently done every five years. As specified in the current *Statistics Act*, the census years for both are the years ending in 1 and 6. For 2011, "Census Day" for both censuses was May 10, 2011. For the last few cycles, the Census of Population had been conducted as a short form to be completed by 80% of households, and a long form, to be completed by the other 20% of households (those not receiving the short form). The Census of Agriculture is conducted using a single form, to be completed by every operation producing agricultural products intended for sale. Under the *Statistics Act*, completion of the Census of Population and the Census of Agriculture is mandatory.

In June 2010, the Government took the decision to make changes to the 2011 Census of Population. In a formal statement in July, 2011, it was announced that the mandatory short form was

² The internet response channel for the Census of Population and the Census of Agriculture were closed in August, 2011. Census of Agriculture mail and telephone collection will continue until late November, 2011, so the total number of responses from all channels was not known at the time of writing. Official response rates, coverage rates and other measures will be released in the spring of 2012.

retained, but that the mandatory long form had been eliminated, and replaced with a *voluntary* National Household Survey (NHS) to meet the need for the information previously collected by the long form. The census would be received by 100% of households and the NHS would be sent to one-third of households.

There were no direct changes to the 2011 Census of Agriculture, although the changes to the Census of Population had potential indirect effects. For example, whereas in the past every agricultural operation would receive a Census of Agriculture form and, associated with their household, *either* a Census of Population short form (80% chance) *or* a long form (20% chance), in 2011 they would receive, with certainty, a Census of Agriculture form plus a Census of Population form *and*, with a one in three chance, be selected to complete the NHS. For those getting all three, there was the further potential complication that the two censuses were mandatory and the NHS was voluntary. Thus, there were some concerns about the additional burden placed on agricultural respondents which might affect response rates and about the possibility that there could be confusion between the NHS (the voluntary replacement for the former mandatory long form) and the mandatory Census of Agriculture form which is “long form” relative to the (short form) Census of Population³. At the time of writing, although collection for the Census of Agriculture was not fully completed, there is some evidence of minor confusion about the mandatory nature of the 2011 Census of Agriculture. Concerns about burden do not seem different in 2011 compared with previous cycles.

Even though collection of the Census of Agriculture may not have suffered any major ill effects, the fact that farmers would be subjected to additional reporting requests in 2011 was taken into account. Statistics Canada does normally scale back slightly its agriculture survey program⁴ in a census year in recognition that agricultural operators are expected by law to complete the Census of Agriculture. This is done even though, as economic surveys, most agriculture surveys are also mandatory under the *Statistics Act*. The Agriculture statistics program has always made it a priority to manage and reduce burden and the need to do so was emphasized by the public discussions surrounding the changes relating to the Census of Population. One indirect effect of the 2011 Census of Population changes was to underscore the Government’s desire to remove or minimize intrusiveness and this highlighted the fact that it is within the scope of the current *Statistics Act* to not conduct a Census of Agriculture in the years ending in “6”, should the government so choose⁵. This option, which has not yet been exercised, was nevertheless seen as a real possibility, perhaps as early as 2016.

Another indication of the seriousness of the government’s concerns about reporting burden on smaller businesses was the announcement by the Prime Minister on January 13, 2011 of the creation of the Red Tape Reduction Commission, which would hold public consultations, including online forums, and report in the fall of 2011. Although temporarily “on hold” during the federal election campaign in the spring of 2011, the Commission has been very active and has provided federal departments, including Statistics Canada, with information collected during in-person and on-line forums concerning red tape issues reported by businesses. This information is also available on the Commission’s website

³ Prior to 2011, when 80% of farm households received the Census of Population form, and all got the much longer Census of Agriculture form, they may have thought of the two as the “short” and “long” form, respectively. Since the media often carried stories referring to the termination of the long form, or the new voluntary long form, it was recognized that there was potential to have some difficulty in collecting the Census of Agriculture forms in 2011, if the public misunderstood it to be voluntary.

⁴ By reducing sample size on some surveys in the field concurrently with the census or actually dropping a survey occasion from certain sub-annual surveys.

⁵ *Statistics Act*, Section 20: “A census of agriculture of Canada shall be taken by Statistics Canada

(a) in the year 1971 and in every tenth year thereafter; and

(b) in the year 1976 and in every tenth year thereafter, unless the Governor in Council otherwise directs in respect of any such year.” 1970-71-72, c. 15, s. 19.

(www.reducedredtape.gc.ca). As expected, a number of federal departments were specifically cited as problematic by people offering input to the Commission, Statistics Canada included. The volume of “complaints” aimed at Statistics Canada was not high given the very large number of survey contacts per year; nonetheless, this exercise is being taken very seriously. The general themes of the comments specific to Statistics Canada were:

- Business surveys are seen as burdensome (some more than others);
- Some questions asked are felt to duplicate information asked by other federal departments;
- The purpose, relevance or use of the data collected is not always apparent to respondents;
- Collection practices are not always appreciated;
- Businesses feel they should be compensated for the time it takes to respond to surveys.

This undertaking is relevant to the agriculture statistics program since its surveys are considered business surveys, and many agricultural operations in Canada would be considered to fall into the small and medium size categories, which are the Commission’s primary interest. The Commission released a report entitled “What was heard” on September 6, 2011⁶. The Commission continues to invite feedback (via its website) from the business community (until September 23, 2011) and is due to deliver its final report later in the fall of 2011.

Most statistical agencies face the continuing challenge of managing the ever-increasing appetite for information, both the continuation/expansion of existing series and the production of new statistics to meet emerging needs. Statistics Canada is no exception and a number of mechanisms are in place to help ensure its resources are being directed at the highest priorities. The CBA initiative noted above is a good example of one such mechanism. It is also, in many countries around the world, a time when governments are contemplating or implementing budget deficit containment or reduction measures, and so as governments seek ways to ensure the greatest value for money, statistical agencies are being asked to do their share. In Canada, the federal government has announced in its 2011 budget (released in spring 2011) a deficit reduction action plan, which aimed to eliminate the annual federal budget deficit by 2014-15. Departments have been asked to propose spending reductions which will be discussed in the fall of 2011, with decisions to be announced in the spring 2012 federal budget.

All of the above initiatives and measures have combined to make a thorough review of the Canadian agriculture statistics program inevitable. Given the scope of the change which will result from these drivers, the timing would seem opportune to think about and propose new ways of producing the agricultural information needed by governments, markets, analysts and agricultural producers themselves. On the other hand, with so much change ahead, there is uncertainty about the future which adds to the challenge of formulating and evaluating options for a new or redesigned program, which could take several years to implement.

3. Approach Taken to the Review

The mandate of the review was to examine all aspects of the Agriculture statistics program, including the surveys, the Census of Agriculture and the use of other data sources such as administrative programs and remote sensing methods, with a view to proposing an alternative program that would be relevant and meet user needs, but also reduce the burden placed on respondents (Statistics Canada 2011a). Improving the efficiency of the program was also to be a consideration.

⁶ “What Was Heard Report: Cutting Red Tape...Freeing Business to Grow” is available at <http://www.reducedredtape.gc.ca/index-eng.asp>

Given the many converging forces noted in the previous section, and the broad scope of the review, the planned approach was to conduct the review in two phases, with fiscal year 2011/2012 being Phase 1. As the next Census of Agriculture would normally occur in 2016⁷, time was of the essence, and so several initiatives were launched in parallel involving research, consultation and evaluation on a number of topics. The goal of this phase was to describe the current program (to ensure that there was a common understanding of the starting point, and so that alternatives could be compared to a clear “status quo”), to research and describe the agriculture statistics programs in several other countries as a comparison and as a source of ideas, to document agriculture data requirements (both in legislation/regulation and in practice) and to explore alternatives sufficiently to provide clear direction for Phase 2. The second phase, to be conducted in 2012/2013, is planned as a series of pilot or demonstration projects that would identify and explore the impediments as well as assess the viability in a Canadian context of the most promising ideas from Phase 1 and to supply information needed to estimate both the cost of implementing changes on a national scale and the potential savings in respondent burden and operating cost once a new program was in place.

Phase 1 is being funded jointly from Agriculture Division, Census of Agriculture, and Statistics Canada bureau-level resources. A project team was created and organized into a number of task groups. The work in this phase is mostly being carried out by Agriculture Division employees, but there is also significant involvement from the Business Survey Methods Division as well as personnel from Agriculture and Agri-Food Canada (the federal department responsible for agricultural policy and programs). Through the representatives of this latter organization, data and information requirements of this key policy department are being gathered. Some of the main tasks in Phase 1 are briefly described.

A review of international programs of agriculture statistics was undertaken for selected countries. Information was gathered from relevant websites as well as from contacts by telephone, e-mail and in person for a number of countries. In selecting the comparator countries, an attempt was made to include some that were similar to Canada in an agricultural and statistical sense, as well as some known to take different approaches, and to include some that are significant trading partners. The international review was extensive; however, it was narrowed down for purposes of an in-depth review of the programs in England, France, Netherlands, Sweden, Portugal, United States, Australia and New Zealand. These countries were selected as they have an agriculture industry common to developed countries, yet with enough diversity in their programs to be of potential interest for the renewal of the Canadian Agriculture Statistics Program. The programs were examined for their use of surveys, administrative data and other features such as remote sensing applications. The information gathered, coupled with an understanding of each country’s agricultural landscape and socio-political structure, enabled an assessment of the various program features that could potentially be developed for Canada. The review also included an examination of key international initiatives. By looking at the degree to which the current program aligns with the FAO’s “World Program for the Census of Agriculture 2010” (FAO, 2005) and the World Bank’s “Global Strategy to Improve Agricultural and Rural Statistics” (World Bank, 2010), the strengths and weaknesses of the current program would be revealed and concrete areas for program changes to improve alignment would become apparent.

The needs and opinions of agriculture data users were sought using four strategies. One strategy was to hold in-person consultations with key users. For this purpose, two one-day workshops were

⁷ Under “normal” circumstances, the 2016 census cycle would include the fiscal years 2013/2014 to 2018/2019, and work on preparing the funding proposal to be submitted to the government would occur mostly in 2012/2013. For the 2011 Census of Agriculture, funding was approved for the entire cycle (fiscal years 2008/2009 to 2013/2014) in April 2008.

conducted in Ottawa with selected federal, provincial and industry stakeholders (May and June 2011) in order to gather input directly from these key users. The first was held in May 2011 and included representatives from the Statistics Canada Advisory Committee on Agriculture Statistics⁸ as well as federal departments such as Agriculture and Agri-Food Canada, Health Canada, Environment Canada and Fisheries and Oceans. Participants were put into small groups which and asked to discuss a number of issues and questions covering data requirements (frequency, small area, and timeliness), definition of target population, possible administrative data sources, remote sensing, possible barriers to use of non-survey data for estimates, and thoughts on response burden. The results were then presented and discussed in plenary sessions. A similar workshop was held in June with members of the Statistics Canada Federal-Provincial-Territorial Committee on Agriculture Statistics⁹ as well as representatives from a number of industry organizations. A second strategy to gather information on data requirements and uses was comprehensive survey conducted during the spring and summer of 2011 with a selection of current and recent clients of the Agriculture Division's statistical outputs. The survey asked which statistics were used (by variable and level of aggregation), for what purpose they were needed, what levels of geography, periodicity and timeliness were needed, and finally, what information gaps existed. A total of 213 were sent out and 73 (34%) responses were received. The third strategy consisted of a review of the recent Report on Plans and Priorities (RPP) prepared by several of the key federal government departments using agriculture statistics, such as Agriculture and Agri-Food Canada, Health Canada, the Canadian Food Inspection Agency, and Environment Canada. The annual RPP is an individual expenditure plan prepared by each federal department and agency to describe priorities, expected results and associated resource requirements covering a three-year period. By examining the RPPs released in the spring of 2011, short and medium needs for existing or potentially new agriculture data could be identified. Finally, consultations and discussions were held with staff working in divisions within the System of National Accounts Branch at Statistics Canada and a report was provided to the project team by this Branch detailing the data used and whether each was essential, very important, or useful to have.

In order to determine the extent to which the Agriculture statistics program, or parts of it, are required to be used in legislation, the review project participated jointly with the Census of Population review team to engage the Department of Justice in a formal search and review of federal legislation for citations referring to, or containing a requirement to use results from, either census. The project team also undertook to search for references to agriculture surveys. Since agriculture is an area of shared jurisdiction between federal and provincial governments, members of the Federal-Provincial-Territorial Committee on Agriculture Statistics were also requested to provide information on provincial legislation which specifies the requirement to use particular agriculture statistics. In addition, descriptions of how particular agriculture statistics are used in practice to implement, support, or evaluate legislated requirements, even where not explicitly specified, were also sought. In addition to reviewing domestic federal and provincial legislative requirements, the review team also investigated international obligations that rely upon the availability of agricultural data and statistics, both explicitly and by practice. A key component of this review was consultations with the Agriculture and Agri-Food Canada International Trade Negotiations Division.

⁸ Members of the Advisory Committee are drawn from the academic community (Canadian universities with agriculture programs) and from industry (e.g., agricultural associations or groups), across the country, in approximately equal proportions. The Administrator of the US National Agricultural Statistics Service is also a member.

⁹ Members of this Committee are representatives of the provincial or territorial "Ministry of Agriculture" or similar government organization with responsibility for agriculture. In some provinces or territories, a representative from the provincial or territorial statistical organization is also a member.

An important component of the review was to examine the current approach to defining the target population for the agriculture program. In Canada, the Census of Agriculture considers anyone producing agricultural products with the intention to sell as part of the agriculture target population and therefore in-scope for the Census of Agriculture. In some cases, surveys use a threshold to determine a unit's eligibility for being selected into the sample as well as to assign in-sample units to strata. These thresholds may be based on a minimum sales amount, or on a physical size measure such as number of acres or number of animals. Studies to determine the impact of changing the target population and studies will also be conducted on the impacts of making changes to the sampled population.

Another important component of the review was to develop an evaluation framework for assessing different options for a redesigned Agriculture statistics program. This framework was developed by agriculture methodologists and included 10 major dimensions¹⁰ which covered 29 different aspects of a statistical program¹¹. The framework was used to assess three preliminary alternative program models by rating each alternative relative to the current program on a 0 to 10 point scale, with 5 indicating that the alternative would be “equivalent” to the current program, and lower or higher scores signified that the alternative was assessed as being poorer or better, respectively, than the current program. The three preliminary alternatives were constructed out of components studied during the review of international models as well as the current Canadian model. As a result, the three preliminary models were labelled “modified British”, “modified US/Australian” and “modified Scandinavian”. Two further alternatives, known as “Hybrid A” and “Hybrid B” were also created and assessed in a second round, following the assessment of the three preliminary models. Persons from the project team plus a selection of other persons having knowledge of, and experience with, agriculture statistics programs, about 25 persons in all, each individually assessed and rated the alternatives. Following the individual ratings, a series of sessions were held to discuss the scores in order to reach a consensus score on each component for each alternative model.

4. Summary of Review Findings

The international study revealed that developed countries place a great deal of importance on their agriculture statistics programs. Most developed (and many developing) countries conduct a census of agriculture every five years, except for those countries belonging to the E.U. who are required to conduct one every ten years, supplementing every three years with an extensive and comprehensive farm structure survey. Some E.U. countries, on the other hand, have developed such an extensive administrative agriculture program that they are able to conduct an agriculture census annually using data from these programs. The review of the “World Program for the Census of Agriculture 2010” and “Global Strategy to Improve Agricultural and Rural Statistics” demonstrated that the current Canadian Agriculture statistics program aligns reasonably well with these two international programs. However, even though the current program has been built up over many years, the alignment is by no means 100% – there are still some gaps in content and in other suggested features¹² – and the key risk could be that in the drive to reduce burden and cost, the non-alignment widens, rather than narrows in the coming years.

¹⁰ The 10 dimensions are: relevance, accuracy, coherence, timeliness, interpretability, accessibility, respondent burden, cost, operations, and acceptability.

¹¹ To illustrate, under the “relevance” dimension there are four aspects: content, frequency, target population, and small area data needs; under the “acceptability” dimension, there are two aspects: acceptability to data users, and acceptability to respondents (data providers).

¹² For example, some information is gathered *only* on the periodic Census of Agriculture, rather than with a core/supplementary type of approach.

The utilization of remote sensing applications was also reviewed internationally. It was noted that although no country presently fully replaces surveys with remotely sensed data alone, the technology is utilized in many countries at a higher capacity than is done in Canada at present. It was also noted that there are a number of pockets of activity within Canada, at varying levels of intensity and development, and in various organizations, involving the use of remote sensing in the production of agriculture and agriculture-related statistics. It is evident that the increasing the existing collaboration between Statistics Canada and other federal departments and other organizations, both domestic and international, using remote sensing applications will be essential to realizing the benefits of this technology, such as significant reductions in reporting burden, gains in quality and the potential to see efficiencies in data collection and processing.

A number of key messages emerged from the user consultations conducted for the review, and these are briefly summarized below. The over-riding message would appear to be that users of agriculture statistics would clearly welcome more, rather than less, information from a redesigned program, but that the need to improve efficiency and reduce reporting burden was also acknowledged. Some of the key messages included:

- The current agriculture statistics program delivers outputs that are high quality, relevant, timely, trustworthy and extensively used for many different purposes. At the same time, information needs are growing and several data gaps were also revealed (such as aquaculture, information on production practices and risk management practices, to name just a few);
- There was an expressed preference for a Census of Agriculture to be conducted every five years as it was felt that performing a complete enumeration only every ten years would leave a volatile and dynamic industry at risk of having insufficient information;
- The small area data such as are provided by a periodic complete enumeration were noted to be the only source of critical data required for many different purposes, such as environmental reporting (for example, reporting for the Kyoto protocol), aiding in crisis management (such as the Manitoba floods) and livestock disease management and compensation strategies (such as BSE outbreaks);
- The most efficient method of collecting and compiling the agriculture data required by the many key stakeholders is to have Statistics Canada as overseer of the national agriculture statistics system;
- Response burden was acknowledged as an important issue and it was felt that it could be reduced with increased collaboration with other data holders; however, this may require changes to legislation, tying agriculture statistical requirements to program delivery, and a spirit of cooperation from producers, their associations and governments at both the provincial and federal levels;
- Investments in technology (such as remote sensing) could also increase the efficiency of the program and at the same time reduce response burden; building on existing collaborations amongst departments to be able to realize the utmost in efficiencies was supported and encouraged;
- There was support for increasing use of administrative data sources as a way to reduce reporting burden, with the provisos that current levels of quality and confidentiality would be maintained;
- Changes in the definition of the target population were viewed with some anxiety and it was noted that any changes should be accompanied by comprehensive documentation and sufficient back-casting of previously issued statistics at sufficient levels of commodity and geographic detail in order to make the new series useful.

In terms of the international review findings, as a member of the World Trade Organization (WTO), Canada must submit notifications regarding the implementation of its commitments under the Agreement on Agriculture in the areas of domestic support, market access, export subsidies and food aid. Agriculture and Agri-Food Canada requires domestic production, prices, value of sales/receipts, on-farm stocks and waste data that are only available from the Statistics Canada Agriculture statistics

program. They also require import and export data from the International Trade Division at Statistics Canada. The quality, reliability and availability of these data are essential as trade disputes could arise should WTO members contest the data underlying Canada's notification.

Aside from WTO requirements, to negotiate, protect and increase Canada's ability to trade internationally, Canada requires reliable official statistics on domestic agriculture production, such as areas seeded and harvested for grains and oilseeds and detailed livestock inventories by type. Domestic agriculture production statistics and the reputation of the Statistics Canada can come under close scrutiny, particularly during trade disputes.

A review of federal legislation was conducted to ascertain legislative requirements for agriculture statistics. The legislative review revealed that at the federal level alone there are 34 consolidated acts pertaining to agriculture directly. In addition to the consolidated acts, there are several federal environmental acts, including the *Kyoto Protocol Implementation Act*, which make extensive use of the Statistics Canada small area data produced by the Census of Agriculture. Several other federal acts relating to banking, the federal-provincial transfer of wealth and the *Statistics Act* require the use of agriculture data. It was found that typically, legislation referring to requirements for agriculture data do not explicitly name surveys or datasets, thus opening the possibility to modify the means by which the data and statistics are produced.

At this time, provincial agriculture statistics contacts are undertaking a similar legislative review at the provincial level. Although the provincial legislation review is still in progress, based on the information provided by some early responding provinces, it appears that there are many pieces of provincial legislation which pertain to agriculture and that while it is typical that these do not make explicit reference to specific data sets, statistics or sources of information, there has been built up a practice of extensive reliance on the statistical series produced by the Statistics Canada agriculture statistics program.

The international legislative requirements of the Canadian Agriculture statistics program lie within the framework of the Food and Agriculture Organization (FAO) of the United Nations (U.N.) of which Canada is a founding member. The *FAO Act* requires each country to provide agriculture, nutrition and food data as requested by the FAO.

As a first step in the alternative model evaluation exercise described in Section 3 above, the three preliminary modified country models were evaluated. While parts of each model were rated as superior to the current model, the assessments produced overall scores indicating lower performance on the rated dimensions. This is perhaps not too surprising a result since the three preliminary models were generally based on models from other countries and the lower scores (versus the current Canadian program) on some dimensions may simply reflect the fact that something that is well-suited and works well in one country may not transplant easily to another. A variety of reasons could account for this such as differing statistical infrastructures, differences in governance, differing degrees of experience and acceptance of certain approaches among suppliers and collectors of data, and so on. Despite the finding that none of the three preliminary models in their entirety could be efficiently adapted to deliver the Canadian program within a reasonable timeframe, it was clear that elements of the current model, coupled with certain elements of these three models could be blended into "hybrid" models that would have a good possibility to be phased- in on a reasonable timeframe and in a cost-effective manner.

The second step of the evaluation considered two hybrids, "A" and "B", taking the best of the three preliminary models, the primary difference between the two being that "A" proposed a decennial

Census of Agriculture and some modifications to the survey program to account for the longer interval, while “B” proposed to retain some form of Census of Agriculture every 5 years (possibly reduced in the non-decennial years), but would include reductions to the survey program between censuses in order to reduce response burden. Both “A” and “B” would include increased usage of administrative and remote sensing data as means to lower survey response burden placed on agricultural producers. Based on evaluation using the same 29 criteria as in the preliminary round, Hybrid model “B” was deemed as the more promising as it builds on the strengths of the current model and therefore provides an evolutionary type of approach to integrating new features into the Canadian Agriculture statistics system, while addressing the requirement of reducing response burden. The Hybrid “B” model includes:

- a reduced Census of Agriculture every 5 years (in years ending in “1”, it would still be comprehensive, but smaller than the current instrument; in years ending in “6”, it would be core content only);
- increased use of taxation data in place of surveying;
- increased use of other administrative data in place of surveying;
- a reduction in the number of farms eligible to be surveyed while maintaining the target population for which estimates are published (agricultural production with intent to sell);
- increased use of remote sensing in order to reduce and replace surveying.

The recommended model recognizes the need for small area data, provincial benchmarking and critical survey frame information at 5 year intervals, but there is still a risk of data loss should the Census of Agriculture in years ending in “6” be cancelled by Order in Council, as is now provided for in the *Statistics Act*.

It is important to note that since some elements of the recommended model involve new activities or rely on data sources that are not yet developed, further cost and feasibility analysis will be required prior to official adoption of the recommendation and before implementation could begin. A proposal has been made for further investigation and analysis into remote sensing technologies, administrative data sources and changes to sample survey populations for the 2012/2013 fiscal year. There are 6 proposed studies in all and these are further discussed in section 6 below.

5. Challenges Faced in Redesigning the Program

While the initial work on the review of the agriculture statistics program has pointed to a number of promising directions for a redesigned program, it has also revealed a number of important challenges to be met along the road to achieving a program that will meet user needs, lower the response burden on agricultural producers, and incur lower operating costs than the current program. These challenges are discussed below in two broad categories, practical and statistical, although in some cases the distinction between the two is not sharp.

5.1 Practical Challenges

One of the main pillars in a redesigned program will be a greater reliance and exploitation of existing data sources held by others, primarily those data collected for administrative purposes. In this sense, the first important challenge will be to obtain access to these data sources. Although the

Statistics Act does give Statistics Canada considerable powers to compel access¹³ to data required for the fulfillment of its mandate, and this mandate explicitly includes the Census of Agriculture (see footnote 5) and agriculture statistics¹⁴, a collaborative, negotiated approach has always been preferred. Given that assembly of the data required to cover agricultural activity on a national level will require access to data across multiple jurisdictions (for example provinces), it can be expected that it will take considerable time to get all of the necessary access agreements in place.

Once access is obtained, it will likely be discovered that differences, possibly substantial, exist between data sources even when they are, in theory, part of the same “system.” For example, a federal agricultural program may be delivered across the country, but each province may administer it slightly differently (or it may be administered federally in a particular province) and therefore the data gathered related to this program may not have exactly the same content, timing of availability, frequency of update, correction procedures, formats, and so on from one jurisdiction to the next. How to work with such variations presents a very real practical challenge and leads to the statistical challenge of whether, and how, to adjust for such differences when using gather data to produce statistics.

Even if the above challenges were overcome, there may be a tendency for the administrative data source to change over time. It is one thing if changes occur affecting all of the sources, such as a change in a program parameter which causes all provinces to add or delete the same or similar variables to their administrative reporting requirements. In this case, the statistical agency would need to account for this in the analysis and dissemination of time series, but the basic program would not be gravely affected. One could even envision that this kind of drift would be a good thing as the programs adapt to the needs of the industry, with the administrative data sources keeping pace. On the other hand, if the drift implies divergence (such as great differences in content, some provinces discontinuing entirely their participation, etc.), then it may not take long before it becomes very difficult to derive any semblance of a national set of statistics from the disparate pieces. Another type of change could result from the fact that some administrative programs are voluntary and therefore the datasets that result from them may have varying degrees of coverage over time and across jurisdictions. Also, those who chose to participate in voluntary programs may not be a representative sample of the entire population of interest.

In some instances, the administrative sources may be less tightly related than in cases where different jurisdictions are implementing a common national program. Each program may have much more freedom to adopt their own concepts and methods, resulting in databases that are similar only in a very nominal sense. In this case, it may be quite difficult to prepare national statistics and the best

¹³ *Statistics Act*, Section 13: “A person having the custody or charge of any documents or records that are maintained in any department or in any municipal office, corporation, business or organization, from which information sought in respect of the objects of this Act can be obtained or that would aid in the completion or correction of that information, shall grant access thereto for those purposes to a person authorized by the Chief Statistician to obtain that information or aid in the completion or correction of that information.” 1970-71-72, c. 15, s. 12.

¹⁴ *Statistics Act*, Section 22: “Without limiting the duties of Statistics Canada under section 3 or affecting any of its powers or duties in respect of any specific statistics that may otherwise be authorized or required under this Act, the Chief Statistician shall, under the direction of the Minister, collect, compile, analyse, abstract and publish statistics in relation to all or any of the following matters in Canada: (a) population; (b) agriculture; (c) health and welfare; (d) law enforcement, the administration of justice and corrections; (e) government and business finance; (f) immigration and emigration; (g) education; (h) labour and employment; (i) commerce with other countries; (j) prices and the cost of living; (k) forestry, fishing and trapping; (l) mines, quarries and wells; (m) manufacturing; (n) construction; (o) transportation, storage and communication; (p) electric power, gas and water utilities; (q) wholesale and retail trade; (r) finance, insurance and real estate; (s) public administration; (t) community, business and personal services; and (u) any other matters prescribed by the Minister or by the Governor in Council.” 1970-71-72, c. 15, s. 21; 1976-77, c. 54, s. 74.

alternative may be to use the information to produce regional statistics, or to use the administrative information to supplement (but not completely replace) data gathered in other ways such as by surveys. In this case, response burden and cost could still be less if the amount of surveying was significantly reduced, that is, limited to only that needed to fill in the gaps in the administrative data.

Another strategy already identified as a likely pillar of a future Agriculture statistics program is the increased use of remote sensing. The Agriculture statistics program already has some experience in using remote sensing (satellite images, aerial photographs and direct ground-level observation at-a-distance) to produce area estimates for certain crops in a small province (Statistics Canada, 2009b). There is also considerable experience with an application that tracks weekly crop conditions throughout the growing season using a normalized difference vegetation index derived from low resolution (1000 m and 250 m) satellite images and provides yield estimates during the middle part of the growing season, based on simple models (Statistics Canada, 2010). The potential of remote sensing lies in the possibility to replace surveys which ask for variables such as area (planted, harvested), production and yield with estimates derived from remote sensing data. One of the practical challenges is the ability to obtain, at a reasonable cost, images of sufficient coverage and resolution so as to allow highly reliable identification of many different types of crops. For most crops, this will require images at more than one point during the season, and for some it may require several (to allow similar crops to be distinguished by according to their development over time). Besides cost, a related issue could be the capacity of the satellite infrastructure and the fact that in some cases, other priorities (such as defence or environment) may displace image acquisition and storage capacity that has been “booked” for agricultural applications. Some other challenges include dealing with technology changes as old satellites are retired and new ones take their place, changes in quality that may disrupt time series estimates and unforeseen malfunctions and failures that may temporarily interrupt the supply and/or quality of images and data.

Another important practical challenge will be to manage costs, both the development costs to create the portions of the new program that do not currently exist and the ongoing operational costs to gather data from the alternate source, process the data to produce the statistics and finally disseminate the information. In theory, once the data are in, the costs to process and disseminate should not be too different according to how the data were received, although combining data from a number of different sources may lead to more complex processing, estimation and validation systems, so costs could be higher as compared with an established survey-only based system. Once new systems are in place, the costs associated with operating the previous system can be redirected to support the new system, so the main challenge may be to get through the period where both systems are operating. Some trade-offs may be needed for example, where a small, targeted survey now gathers data at a low cost but imposes significant response burden on the producers being surveyed but could be replaced with a low or no burden alternative which costs considerably more to operate.

5.2 Statistical Challenges

For traditional survey-based estimates, there exists a familiar suite of indicators to inform users about the quality of the estimates that have been produced, including measures such as overall response rates (various types), statistics based on standard deviation such as coefficients of variation and confidence intervals, non-response rates (total, item), imputation rates, results of over- and under-coverage studies and so on. In the case of administrative databases held by others, it is perhaps unlikely that any sampling design exists and therefore attempts to calculate statistical measures lose their meaning. In the case of databases associated with mandatory programs or requirements (e.g., a regulated sector), in theory all in-scope producers should be present on the administrative database so

some of the traditional type indicators may apply, such as the percentage of records with fields missing, rates of correction (e.g., where a record has had one or more fields edited or imputed). In cases where the holder of the administrative data has done some processing or adjustment to the records, it will be important to have comprehensive documentation covering the methodology behind the collection and/or processing of the information in order that its use for statistical purposes can be properly assessed. If such documentation practices are not pre-existing, additional time or cost may be incurred to support the administrative data provider to produce and maintain it, or the statistical agency may be faced with working with the data “as is.”

In some cases, the program may need to produce estimates using data from several sources in order to provide a complete picture of a particular sector. This could be the case if, for example, different occasions used different sources. For example, in the context of in-season crop estimates, one might think about producing planting intentions estimates from a survey of farmers, followed by seeded area estimates based on data in crop insurance databases, then subsequently, area estimates based on remote sensing, then perhaps expected production estimates based on remote sensing (for areas and crop condition), then final production estimates based on a survey (possibly combined with administrative sources). A statistical challenge would be to somehow account for the possible noise introduced into the time series (users would surely see the sequence of estimates as a time series even if copious caveats were attached to each publication occasion warning against inappropriate comparisons). Another possible scenario is to piece together the estimate for a single occasion from several sources. One could imagine that for a particular commodity in a particular province, there could be a strong producer association which gathers information from producers and maintains a database with virtually complete coverage, high quality data and complete documentation. Here, assuming these data were accessible, there would be no need for a survey or other data collection efforts. This could be the case where there are regulatory requirements associated with operating in that market. In other provinces, where perhaps this commodity is less important, there may be no single strong administrative source, but perhaps some that could be tapped into (such as crop insurance, program files) and supplemented with a small survey of the known top producers not covered by the administrative source in order to provide an estimate. For the remaining provinces, and where the production of that commodity is small but non-negligible, where no suitable administrative source exists, and where mounting a survey may not be cost-effective, signals from taxation records might be used to aid in producing an estimate. It would be a challenge to blend these sources within the timeframe required to produce a coherent and timely estimate. In addressing issues such as these, the redesign of the Canadian agriculture statistics program could benefit from work done at other statistical offices, such as Statistics Sweden (Wallgren and Wallgren, 2007).

Throughout the review, the issue of availability of small area estimates came up regularly. Currently, the Census of Agriculture provides estimates at low levels of geography every five years. Also, for some commodities and activities, it is the only source of information. For example, the regular annual and sub-annual program of livestock statistics collects and publishes information on major livestock categories (cattle, sheep, pigs, poultry, mink) and their main products (e.g., meat, milk, eggs, furs). On the other hand, the census covers these, plus the so-called “alternative livestock” categories, including animals such as goats, bison, llamas, alpacas, rabbits, among others. Should the ability to produce estimates based on directly collected data for small geographic areas or for rarer commodities be diminished, other statistical methods would have to be developed to fill the gaps. While no doubt sound statistical models could be developed based on the appropriate investment of resources and the availability of suitable auxiliary information, a further challenge would be to ensure the credibility of the modelled estimates. This challenge may be significant since there exists a lot of local information about agriculture, which could make it quite easy for a poor small area estimate to be

pointed to as an “error”, which could have the side effect of casting doubt on the credibility of the modelled estimates in general, or even all of the estimates generally.

There may be statistical challenges associated with the maintenance of the quality of the agriculture list frame. In the current program, the Farm Register is the frame for the census and the surveys and it is extensively updated and improved corresponding to the five-year cycle of the Census of Agriculture. Activities are undertaken in the months leading up to the next census to ensure the frame is as complete and accurate as possible. This is done through activities such as obtaining producer lists and conducting frame update surveys. After each census, the results serve to correct and improve the frame even further by identifying new agricultural operations (births) as well as ones no longer in operation (deaths), and providing updates on characteristics for those continuing operations. It has already been noted that the Farm Register will be migrated into the Business Register. In this new environment, there will be regular incoming signals, such as information from the income tax system, as well as survey feedback, which will serve to update the information on those units to which the signals apply. This helps to ensure the frame remains up to date and can provide the basis for efficient samples for the survey program. One possibility in the post-program review environment is that the Census of Agriculture may change frequency and/or content. This would affect the frequency and amount/type of information with which the entire frame could be updated (based on the complete enumeration provided by the census), and therefore may affect the quality of the frame, which in turn could affect the statistical quality of the surveys using that frame.

One of the key drivers in the review of the agriculture statistics program is response burden reduction. Given this, it is possible the target population may be defined by a different threshold¹⁵, or, more probable and even quite likely, that the surveyed population (in cases where surveys still exist) would be defined by a different (i.e., higher) threshold (which could also be thought of as the threshold defining the “take-none” stratum). While this certainly eliminates the burden of responding to surveys for those operations under the threshold, it introduces a number of statistical challenges. One is that the threshold may be set in a number of ways. For example, the threshold could be set as an absolute size limit based on values of sales, or physical size of the operation (e.g., in acres or in number of animals), or a combination. It would also need to be decided whether the threshold was revised regularly, periodically or never. A different approach could be to set the boundary in a floating manner, such that some pre-set (small) percentage of an important variable (value, acreage, production quantities, etc.) was below the threshold. In this case, the boundary moves up and down in order to keep the non-surveyed proportion constant whereas in the former approach, the boundary is more stable, but the portion excluded from survey changes.

A statistical challenge that flows from modification of the exclusion thresholds for the surveyed population (i.e., those units included in the target population for which estimates are to be produced, but not eligible to be sampled) is how to adjust estimates to account for the non-surveyed portion. In the past, where there were no (or very minor) exclusions, simple adjustments were sufficient given that the excluded units would have very little impact on the value of the final estimates. However, with larger portions of the target population excluded from samples, the potential impact could be much larger and a more robust method should be used to make the adjustments. For financial estimates, this may not be problematic since the taxation data should provide very good information on most revenue and expense items. However, for commodity estimates, other administrative sources would have to be sought, and this raises the issue of whether the content and timeliness of these would be sufficient to

¹⁵ That is, change the definition of what is considered “agriculture”.

allow their use in adjustment methodologies, especially for in-season estimates which are useful only if they can be released within a very short delay after the reference period (Statistics Canada 2011b).

Currently, the predominant collection mode for most agriculture surveys is computer-assisted telephone interviewing (CATI). In some cases, a questionnaire is pre-mailed to the respondent in advance of the start of the CATI collection period. Sometimes, respondents do not wait for the telephone period, but mail the questionnaire back, even though this is not requested or is even asked not to occur. In other cases (generally for smaller surveys), the predominant mode is mail-out, mail-back, but often with telephone follow-up. For a couple of surveys, and for the Census of Agriculture, there is an Internet response option, but information is also received from respondents by mail and by telephone. In some cases, the database of “responses” is a mixture of information received by mail, over the telephone, from administrative sources, from spreadsheets received from respondents by e-mail or through a secure electronic file transfer service. The statistical challenge of continuing to expand the number of ways a respondent may provide the information is that each mode differs with respect to the number and type of edits that can be built in at the collection stage, varying from none, to extensive and complex. There are also differing degrees of interaction with the respondent, ranging from none to a lot, which may affect response quality due to variations in question interpretation or degree of assistance provided. Thus, the data entering an estimation system from the various mode streams will likely vary as to quality and “cleanliness.” How these variations are accounted for and treated during the estimation process is another statistical challenge.

The agriculture statistics program may change significantly in the coming years. Even if the range of outputs were unchanged or almost unchanged (perhaps an unlikely event), it appears quite likely that the manner of conducting the program and the sources of data will change, perhaps quite radically. This has the potential to introduce statistical breaks, possibly substantial ones, into some very long-running data series. Furthermore, series may become automatically more volatile. With a program currently based heavily on surveys and censuses, changes are evolutionary. Changes to questionnaires are relatively gradual, as are changes to universes (frames) and samples. There is a strong emphasis on maintaining comparability and continuity with past data, and the means to do this are within the control of the survey-taker.

In contrast, in a system that is heavily reliant on administrative data and remote sensing technology, the statistics producer is more vulnerable. The agency supplying a key file from its administrative system may decide to stop providing it, or may decide to change the content or frequency, and may do so rather suddenly and without much (or any) consultation from the statistical user. Similarly, a remote sensing data source may suddenly disappear due to satellite failure or the changeover to a newer, different successor satellite using a different technology and therefore producing better, but different, data. Given the extent of an agriculture statistics program spanning many commodities and geographic areas, the statistical and operational challenge of keeping up with many data source changes “controlled by others” would be daunting.

6. Ideas and Plans to Deal with the Challenges

A proposal has been submitted to the Statistics Canada long term planning process requesting approval for work to continue on six fronts in 2012/2013. In most cases, the proposed work is to conduct a pilot or demonstration project on a particular component of the future program, involving a small number of geographic or organizational entities. One of the goals of these pilots is to go through the steps of conception, development and execution on a sub-national scale thereby allowing

information to be compiled on the practical aspects (how much effort is required to obtain access, the costs involved) as well as the statistical (actually producing some estimates and comparing them with the traditionally produced ones) so that the time, effort and cost to implement nationally can be estimated as accurately as possible. A short description of each of the proposed projects follows.

Remote sensing area and yield feasibility – This project will use satellite-based imagery in combination with provincial crop insurance data to produce crop area, yield and production estimates that have traditionally been based on sample surveys. Two or three provinces will be selected for the use of crop insurance data to calibrate the estimation model (e.g., Manitoba, Saskatchewan, Ontario¹⁶).

Administrative data: Animal traceability – This study will examine the current and future potential for incorporating traceability data into the Livestock statistics program. Two provinces will be selected based on the level of cooperation and the maturity of their administrative data source (potentially Quebec and Alberta). As such, the process of negotiating access and partnerships (critical to the use of administrative data sources) will be exercised. The defining elements of this administrative source are that certain aspects are mandatory and that there is a high level of industry involvement (control) in the program.

Administrative data: Agri-Stability¹⁷, Agri-Invest¹⁸ – This study will examine the current and future potential for incorporating the use of Agri-Stability and Agri-Invest data into the Agriculture statistics program. Two provinces will be selected based on the level of cooperation and the maturity of their administrative data source (perhaps British Columbia and Prince Edward Island). As such, the process of negotiating access and partnerships (critical to the use of administrative data sources) will be exercised and the quality, completeness and representativeness of the data will be assessed. The defining elements of this source are that the programs are voluntary and are federal-provincial partnership programs, administered provincially.

Administrative data: Crop Insurance – The study will examine the current and future potential for incorporating crop insurance data into the crop statistics program. Two or three provinces will be selected based on the level of cooperation and the maturity of their administrative data source (perhaps Manitoba, Saskatchewan and Ontario). As such, the process of negotiating access and partnerships will be exercised and the quality, completeness and representativeness of the data will be assessed. The defining elements of this source are that the programs are voluntary and are administered provincially by a mix of government, arms-length and private entities.

Administrative data: Best practices, Inventory of industry holdings – this study will take advantage of expertise in developing administrative data-based programs that exists in different parts of Statistics Canada (e.g., health, justice, education), by consulting with those areas to identify best practices, challenges, etc. It will also inventory the administrative holdings of agricultural data held by industry organizations. The defining elements of these data sources are that they are diverse (voluntary, or mandatory, based on regulations) and are administered by industry organizations (based on commodity, geography or other traits).

¹⁶ The particular provinces are not yet determined, but the idea was to have a variety across and within each project in order to fully examine the feasibility of each approach.

¹⁷ This program provides support when a participating operation experiences a large decline in margin: a payment is triggered if the calculated program-year margin falls below 85% of the 5-year reference margin (average margin of three years after exclusion of the highest and lowest in the past five years).

¹⁸ This program is a self-managed producer-government savings account that allows producers to set money aside which can be used to recover from small income shortfalls or to make investments to reduce on-farm risks.

Surveyed Population: Impact analysis/feasibility of changing parameters for the surveyed population – This study will build on work conducted in 2011/2012 which looked at possible modifications to the target population to examine the feasibility and impact of changing parameters for the surveyed population of the agriculture statistics program.

In the case of the first four projects, the goal is to actually go through all of the steps of identifying alternate data sources, obtaining access to them, and actually using them to attempt to produce estimates for comparison with the traditionally produced survey estimates. By doing this on a large but manageable scale – a province or set of two or three provinces – it is hoped that most practical problems will be encountered and addressed and that enough data will be processed to surface and address most of the statistical challenges. Also, the scale is expected to be small enough to tackle in the time available, but sufficiently large to allow accurate estimate of what effort, time and cost would be required to implement the approach at a national level.

7. Concluding Remarks

The Canadian Agriculture statistics program is at a crossroads. Change is inevitable as efforts to reduce respondent burden and seek ways to improve the cost efficiency of the program will surely result in new methods replacing old, in addition to other possible outcomes such as reductions in content or frequency of information, at least in the near and medium term. Key decision points are fast approaching: a decision on the proposal for future work to pilot options for the future program is expected in mid-November, 2011; the government's plans for deficit reduction will be known when the federal Budget 2012 is presented to Parliament in the spring of 2012. The formal transition of the agriculture surveys into Statistics Canada's Integrated Business Survey Program begins with the production of reference year 2015 estimates, with transitional work beginning in 2013/2014. A major goal of the program redesign is to maintain relevance so that users' needs are met to the greatest extent possible within the constraints faced.

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