

Modernisation of the Agriculture Statistics Program in Canada

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STATISTICS CANADA
ONE HUNDRED YEARS AND COUNTING



Statistics
Canada

Statistique
Canada

Canada

From 1666 to 2016...



2016 CENSUS OF AGRICULTURE

6

COMPLETE ONLINE AT:

www.census.gc.ca

SECURE ACCESS CODE

Ce questionnaire est disponible en français 1-855-859-6273



From 2016 to 2026...



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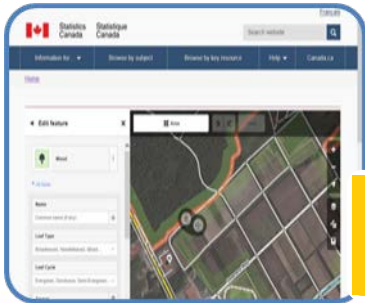
Precision
agriculture data



Satellites



Drones



Crowdsourcing



Summary

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- ❑ Modernization at Statistics Canada
- ❑ Vision for Agriculture Statistics Program in Canada
- ❑ Strategies
- ❑ Challenges

Modernization at Statistics Canada

More, better, faster



Pillar	Vision
User-centric Service Delivery	Users have the information and data they need, when they need it, in the ways they want to access it, with the tools and knowledge to make full use of it.
Leading-edge Methods & Data Integration	Access to new or untapped data; modify the role of surveys; greater reliance on modelling and integration; capacity through R&D environment.
Statistical Capacity Building & Leadership	Integrated approach to collection, sharing, analysis and use of data. To be leaders in identifying, building and fostering savvy information and critical analysis skills beyond our own perimeters.
Sharing & Collaboration	Statistics Canada has developed and nurtured strategic, innovative partnerships that allow for the open sharing of data, expertise and best practices. We are proactive, flexible and responsive to partner needs.
Modern Workforce and Flexible Workplace	Have the talent and environment required to fulfill our business needs at the time and be open and nimble to continue to position ourselves for the future.

The context is rapidly changing



Rapidly changing and increasingly complex economy and society

Farms are increasingly integrated and complex businesses

Proliferation of data and data providers

Increased availability of administrative and alternative agricultural data sources: 300+

Increased free access to high quality satellite imagery

Data revolution, ingenuity and innovation

Refinement of large dataset processing techniques

Increased expectations and demand for “real-time” & detailed data

Agricultural information needs go beyond the primary sector

Data needs to be available more frequently

Agriculture Statistics Program: transition towards a new business model

Vision for the Agriculture Statistics Program

*Through **partnerships** with Canadians, businesses, associations, institutions and government entities and other information centers...*

*...comprehensive, relevant and **integrated** farm data (with trade, food processing, transportation, health, environment, etc.) is produced:*

- Without contacting farmers (AG-Zero project)
- In near real-time
- Under the sensor-first strategy
- At a very fine level of geographic granularity and beyond the primary sector
- Through modern user-centric dissemination channels

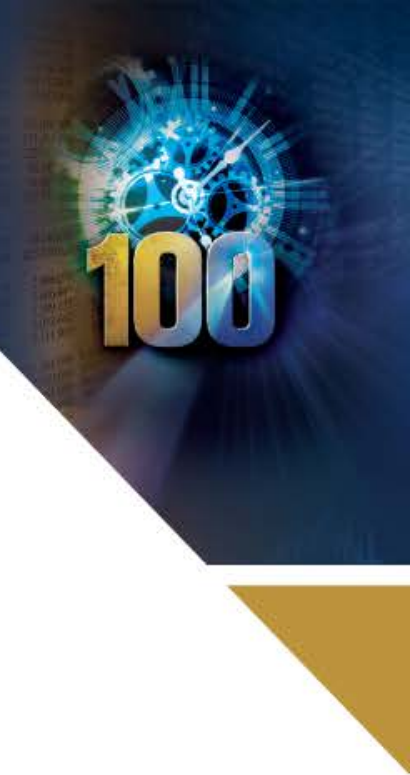


Strategies:

Migration to Business Statistics Platforms

All Agriculture Statistics Programs (including the Census of Agriculture) migrate to the integrated and common platforms and tools used in the Economic Statistics Field within Statistics Canada

- Use of corporate services / generalized systems
 - ✓ Benefit from the leading edge methods introduced in these services/systems
- Better integration with other business statistics programs (e.g. Environment, Manufacturing, Trade) and Administrative Data Programs
 - ✓ Coherence among products
 - ✓ Implementing a « collect-once-use-multiple-times » model
- Harmonized content and concepts between CEAG and other surveys / programs
 - ✓ Review the concept of farms
- Common data repository and analytical tools



Strategies:

2021 Census of Agriculture as a vector of transition

Production of a test environment: Predicted Values Database.

- Feasibility study - produce the results from the 2021 Census of Agriculture in parallel using:
 - ✓ Administrative data
 - ✓ Survey data
 - ✓ Satellite images
 - ✓ Results obtained from models / forecasts
 - ✓ Other?
- Proof of concept:
 - ✓ Used for both Census and survey programs
 - ✓ Assessment of the real cost and effort to move to an administrative data driven Census of Agriculture
 - ✓ Identification of gaps
- Use for validation and imputation



Strategies:

2021 Census of Agriculture as a vector of transition (2)

Variables	Full Replacement	Smart Replacement	Data source
Gender	✓		Census of Population
Greenhouse & Mushroom		✓	Survey
Maple	✓		Administrative
Dairy cattle		✓	Model
Cannabis	✓		Administrative
Employees	✓		Administrative and Model
Hogs	?		Under assessment
Operating Arrangement	✓		Administrative
Total Operating Revenues & Expenses		✓	Administrative
Detailed Operating Revenues & Expenses	✓		Administrative (same as in 2016)

Full replacement:

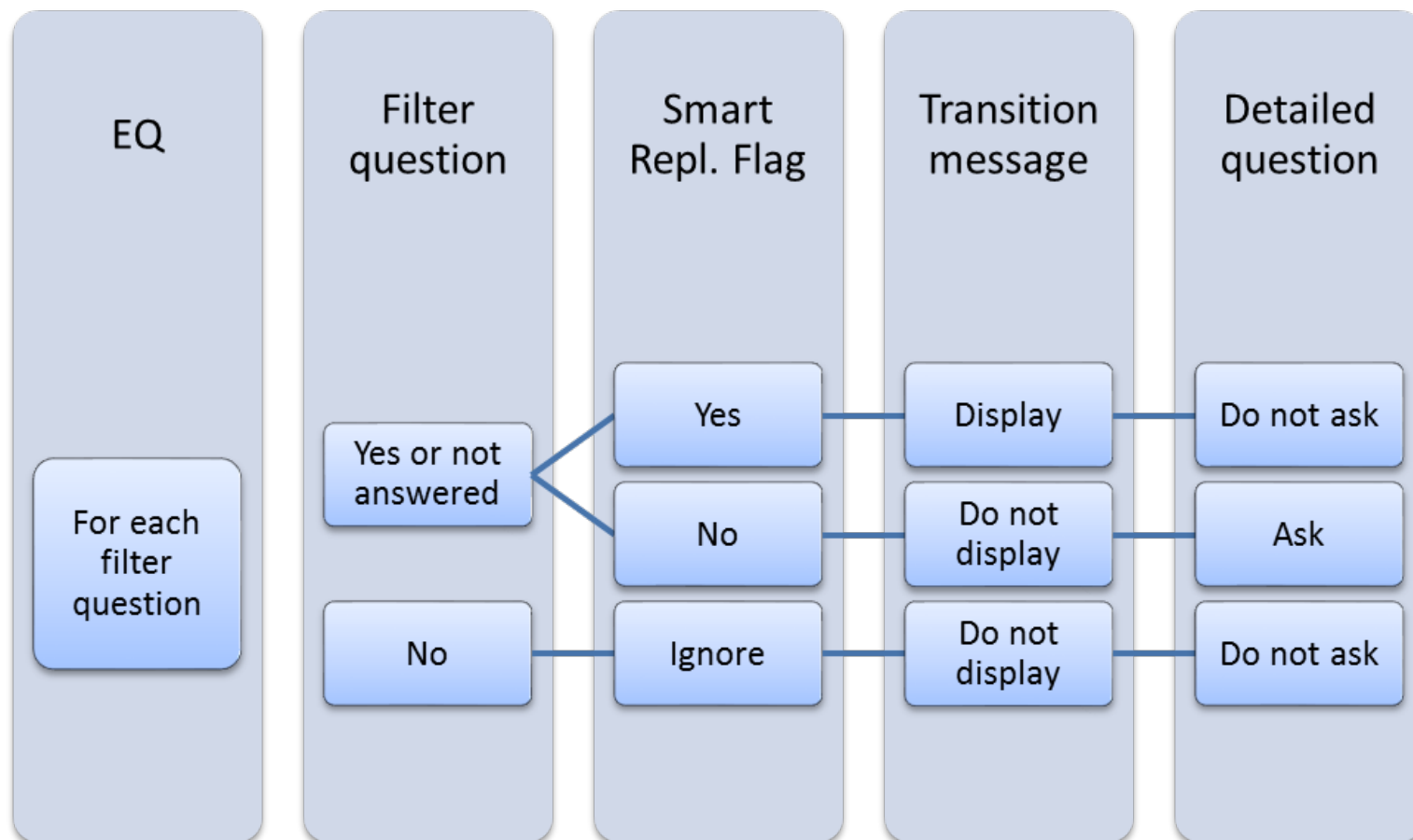
Variables are excluded from respondent collection

Smart replacement:

Collection is customized for each respondent based on the availability of a reliable auxiliary source of information

Strategies:

2021 Census of Agriculture as a vector of transition (3)



Strategies:

Review Dissemination & Disclosure Avoidance

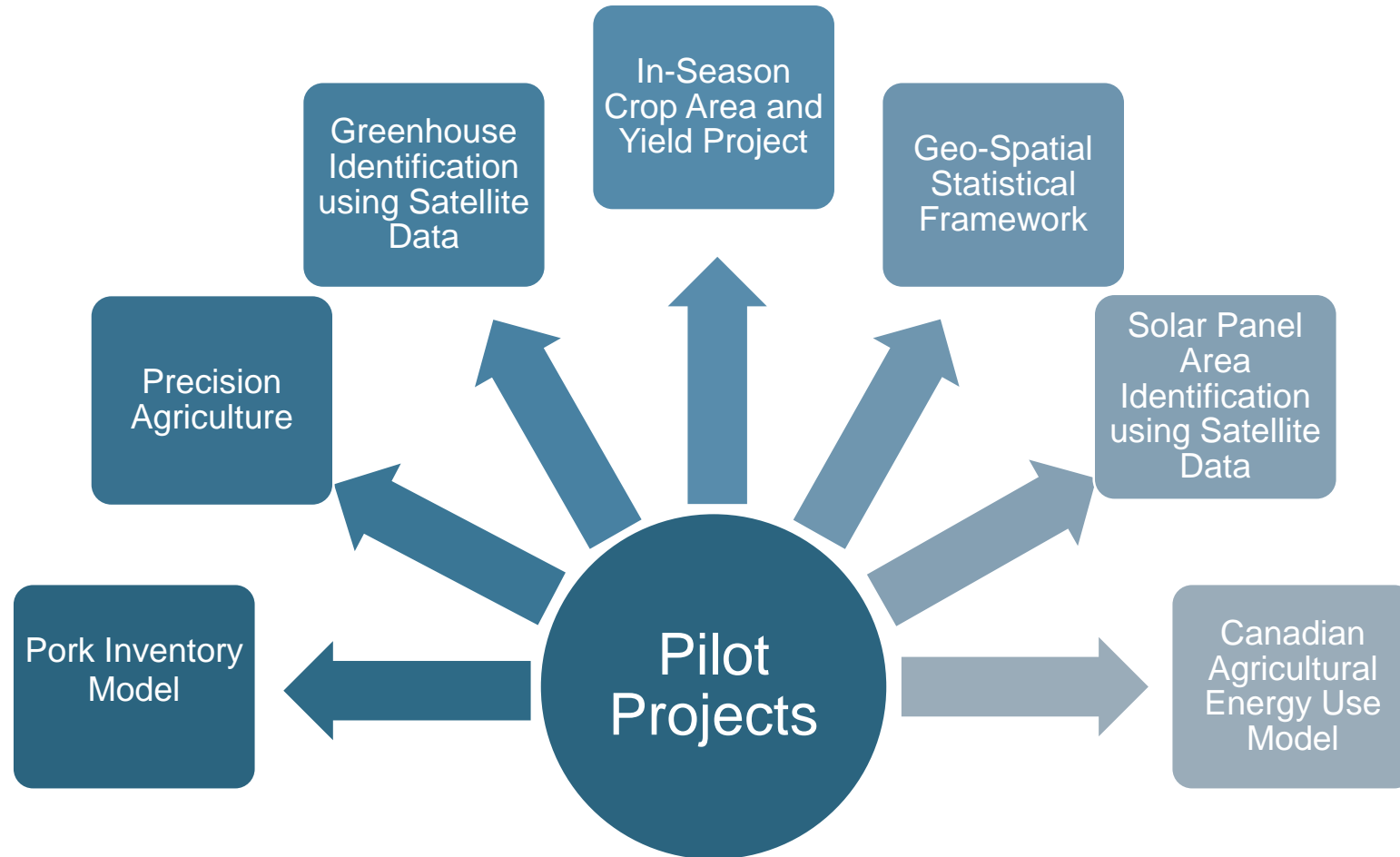
Publish more relevant data without compromising the confidentiality of respondents

- Complete elimination of data suppression as a long-term goal:
 - ✓ Use of public information
 - ✓ Perturbation methods, Decision tree
 - ✓ Review of our tolerance for confidentiality
- Use of the Federal Geospatial Platform and development of self-serve, user-friendly GIS capabilities.
- New economy-wide integrated tables
- Marketing strategy / The Census of Agriculture National Tour



Strategies:

Partnerships and pilot projects



Pilot Projects: In-Season Crop Area and Yield Project

- **Objective**

- Deliver near real-time crop area and yield assessments at low levels of geography without respondent contact
- Replace elements of the conventional crop survey programs
- Reduce crop insurance program delivery costs

- **Approach**

- **Partnership** between StatCan, Agriculture and Agri-Food Canada, Alberta Agriculture and Forestry, and Alberta Financial Services Corporation
- Employs crop insurance as the ground truth for satellite image crop classification
- Weather, agronomic and satellite data used to model yield
- Additional complementary project aims to assess the potential of machine learning to contribute to the modeling process



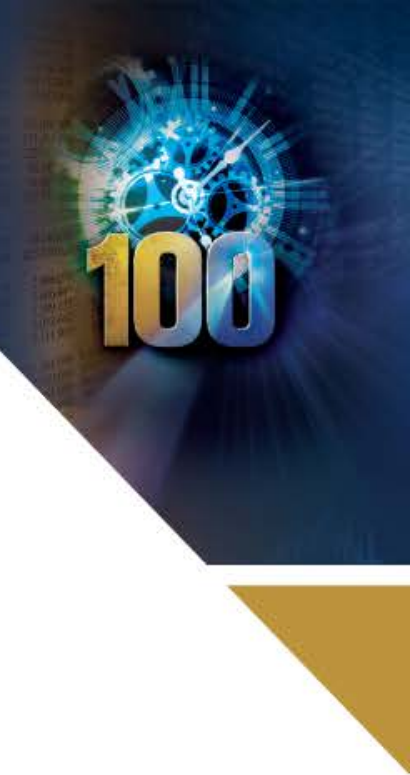
Pilot Projects: Pork Inventory Model

- **Objective**

- Provide near real-time low level data on pork inventories
- Eliminate the need to ask pig inventory questions on the Livestock survey
- Support the sector in times of crisis

- **Approach**

- **Partnership** between StatCan and the Canadian Pork Council (CPC)
- Model is based on PigTrace data
- Models movements into age, sex, and inventory
- Open model produced allowing either StatCan or CPC to run the program and all data users to understand how the statistics are developed – though without the underlying confidential data they can't reproduce the outputs.



Pilot Projects: Geo-Spatial Data Access and Analysis Tool



- **Objective**

- Develop a self-serve user friendly GIS analytical capabilities
- Eliminate the need for a survey with annual data

- **Outline**

- Framework designed to support very granular datasets
- Assist non-traditional GIS users to integrate new tools and datasets in their immediate analytical work
- Development of training materials for users

Challenges

- New data sources / methods / concepts:
 - ✓ Misalignment of reference periods / Breaks in the series
 - ✓ Reduction in the number of farms ?
- Quality: administrative or modelled data versus respondent data
- Privacy
- Alignment of policies and directives
- Effort and infrastructure required for record linkages:
 - ✓ Multiple sources / limited number of records
 - ✓ Large volume of transactions (e.g., precision agriculture data)
- Human Resources: availability of the right skillsets
- Resistance to changes (internal and external)



THANK YOU!

For more information
please visit,
www.statcan.gc.ca



#StatCan100

