General notes

Conversion factors

The following factors are used to convert between different units of measurement:
1 acre = 0.40468559 hectares
1 hectare = 2.47105413 acres
1 arpent = 0.845 acre (for respondents in Quebec who reported land areas in arpents)
1 square foot = 0.09290304 square metre
1 square metre = 10.76391 square feet
1 kilogram = 2.20462248 pounds
1 pound = 0.45359239 kilogram

Rounding

Totals may not equal the sum of their parts due to the use of conversion factors or rounding of fractions to whole numbers

Confidentiality procedures

All tabulated data have been subjected to either a "data suppression" or "random rounding" confidentiality procedure to prevent the possibility of associating statistical data with any identifiable agricultural operation or individual.

The "data suppression" procedure identified and deleted all cell values in the farm data tables that could result in the disclosure of information relating to a specific agricultural operation. In all cases, however, suppressed data were included in aggregate subtotals and totals in each of these tables.

The "random rounding" procedure was applied to all data appearing in the farm operator tables. Employing this technique, all figures in each of these tables, including totals, were randomly rounded either up or down to a multiple of 5. While providing protection against disclosure, this procedure does not add significant error to the data. It does, however, result in certain data inconsistencies which are outlined in the data inconsistencies paragraphs presented below.

Finally, data for those geographic areas with very few agricultural operations were not released separately, but were merged with data from one or more geographic areas.

Data inconsistencies

The application of the "random rounding" confidentiality procedure to data appearing in the farm operator tables, has resulted in the following data inconsistencies:

Since the totals in a table are randomly rounded independently of their component cell values, some differences may exist between the rounded totals and the sum of their rounded components. Similarly, percentage distributions, which are calculated based on rounded cell values, do not necessarily add up to 100%.
Averages, however, are calculated based on unrounded data.

Random rounding can significantly distort results for variables with small cell counts. Individual data cells containing small numbers may lose their precision as a result.

Finally, minor differences can be expected in corresponding totals and cell values appearing in different tables. For example, the total number of farm operators under 35 years of age in Canada in 2006 has been randomly rounded, which may result in slightly different totals occurring in the tables in which the variable appears.

Headquarters rule

Many agricultural operations in Canada are composed of numerous parcels of land in a number of locations. These different locations are often situated in several geographic areas (such as townships or counties). In these situations, the "headquarters rule" assigns all data collected for the agricultural operation to the geographic area where the farm headquarters is located.

Incomplete enumeration of Indian reserves and Indian settlements

On some Indian reserves and Indian settlements in the 2006 Census, enumeration was not permitted or was interrupted before it could be completed. Moreover, for some Indian reserves and Indian settlements, the quality of the enumeration was considered inadequate. These geographic areas (a total of 22) are called incompletely enumerated Indian reserves and Indian settlements.

Data for census farms located on these incompletely enumerated reserves and settlements are therefore not available. The impact of the missing data is very small for higher-level geographic areas (Canada, provinces, and census agricultural regions).
However, the impact is more significant for those smaller areas (census divisions and census consolidated subdivisions) in which the affected reserves and settlements are located.

Incompletely enumerated Indian reserves and Indian settlements in alphabetical order

Name	Province	Census division	Census consolidated subdivision
Akwesasne formerly Akwesasne (Partie)	Quebec	Le Haut-Saint-Laurent	Dundee
Akwesasne (Part) 59	Ontario	Stormont, Dundas and Glengarry United Counties	South Glengarry
Attawapiskat 91A	Ontario	Kenora	Kenora, Unorganized
Bear Island 1	Ontario	Nipissing District	Nipissing, Unorganized North Part
Big Island Lake Cree Territory (formerly Big Head 145)	Saskatchewan	Division No. 17	Beaver River No. 622
Doncaster (formerly Doncaster 17)	Quebec	Les Laurentides	Doncaster 17
Esquimalt	British Columbia	Capital Regional District	Victoria
Goulais Bay 15A	Ontario	Algoma District	Algoma, Unorganized, North Part
Factory Island 1	Ontario	Cochrane	Cochrane, Unorganized, North Part
Fort Severn 89	Ontario	Kenora	Kenora, Unorganized
Kahnawake (formerly Kahnawake 14)	Quebec	Roussillon	Kahnawake
Kanesatake	Quebec	Deux-Montagnes	Oka
Lac-Rapide	Quebec	La Vallée-de-la-Gatineau	Lac-Pythonga
Little Buffalo	Alberta	Division No.17	East Peace No.131
Oneida 41	Ontario	Middlesex	Strathroy-Caradoc
Saddle Lake 125	Alberta	Division No. 12	Smoky Lake County
Six Nations (Part) 40	Ontario	Brant	Six Nations (Part) 40
Six Nations (Part) 40	Ontario	Haldimand-Norfolk	Haldimand County
Tsuu T'ina Nation 145 (Sarcee 145)	Alberta	Division No. 6	Rocky View No. 44
Tyendinaga Mohawk Territory	Ontario	Hastings County	Tyendinaga
Wahta Mohawk Territory	Ontario	Muskoka	Georgian Bay
Wendake	Quebec	Quebec	Quebec

Census terms

Census farm

The definition of a census farm has not remained constant over the years. Changes in this definition since 1921 are summarized below. These changes do affect the comparability of the data among censuses.

Since 1996, a census farm has been defined as an agricultural operation that produces at least one of the following products intended for sale: crops (hay, field crops, tree fruits or nuts, berries or grapes, vegetables, seed); livestock (cattle, pigs, sheep, horses, game animals, other livestock); poultry (hens, chickens, turkeys, chicks, game birds, other poultry); animal products (milk or cream, eggs, wool, furs, meat); or other agricultural products (Christmas trees, greenhouse or nursery products, mushrooms, sod, honey, maple syrup products).

The 1996 definition of a census farm was expanded from the definition used in 1991 to include commercial poultry hatcheries and operations that produced only Christmas trees. In 1996, this expanded definition resulted in the inclusion of 138 commercial poultry hatcheries and 1,593 operations across Canada that produced only Christmas trees. In all other respects, the 1996 definition was the same as the 1991 definition.

For the 1981 and 1986 Censuses, a census farm was defined as a farm, ranch or other agricultural holding with sales of agricultural products of $250 or more during the previous 12 months. Agricultural holdings that anticipated sales of $250 or more in the census year were also included.

For the 1976 Census, a census farm was defined as a farm, ranch or other agricultural holding of one acre or over with sales of agricultural products of $1,200 or more during 1975. However, the basic unit for which a questionnaire was collected was termed an agricultural holding. This term was defined as a farm, ranch or other agricultural holding of one acre or over with sales of agricultural products of $50 or more during the 12-month period prior to the census. At head office, the questionnaires were divided into census farms and small agricultural holdings. Small agricultural holdings were those remaining after the census farms had been removed. For data comparability purposes, all published 1976 Census data has been tabulated according to the agriculture holding definition (i.e., with sales of agricultural products of $50 or more during the 12 months prior to the census) and not according to the census farm definition.

For the 1961, 1966 and 1971 Censuses, a census farm was defined as a farm, ranch or other agricultural holding of one acre or over with sales of agricultural products of $50 or more during the 12-month period prior to the census.

For the 1951 and 1956 Censuses, a census farm was defined as a holding on which agricultural operations were carried out and that was (a) three acres or more in size, or (b) from one to three acres in size, with agricultural production in the year prior to the census valued at $250 or more.

The 1931 and 1941 Censuses defined a census farm as a holding of one acre or more that produced, in the year prior to the census, agricultural products valued at $50 or more, or that was under crops of any kind or used for pasturing in the census year.

The 1921 Census defined a census farm as a holding of one acre or over that produced, in 1920, crops of any kind valued at $50 or more.

Farm capital

Farm capital includes the value of all farmland, buildings, farm machinery and equipment (including passenger vehicles used in the farm business), and livestock and poultry.
Respondents report the value of their land, buildings, farm machinery and equipment as of Census Day. Values for livestock and poultry inventories reported in the census are calculated using data on average farm prices for the various types of livestock and poultry. Farm capital does not include the value of crops in the field or in storage, or farm inputs on hand, such as fertilizer and seed.

Farm operators

Since 1991, "farm operators" has been defined as those persons responsible for the day-to-day management decisions made in the operation of a census farm or agricultural operation. Up to three farm operators could be reported per farm. Prior to the 1991 Census of Agriculture, the farm operator referred to only one person responsible for the day-to-day decisions made in running an agricultural operation.

Farm type

Farm typing is a procedure that classifies each census farm according to the predominant type of production. This is done by estimating the potential receipts from the inventories of crops and livestock reported on the questionnaire and determining the product or group of products that make up the majority of the estimated receipts. For example, a census farm with total potential receipts of 60% from hogs, 20% from beef cattle and 20% from wheat, would be classified as a hog farm. Changes in farm type can reflect a shift in farming activity but could also be influenced by changing commodity prices. This farm type classification, referred to as "historical," is based on the Standard Industrial Classifications (SIC).

For 2006 and 2001, a new farm type classification based on the North American Industrial Classification System (NAICS) has been added to the historical classification used in previous censuses.

NAICS was created against the background of the North American Free Trade Agreement. It is designed to provide common definitions of the industrial structure of the three countries (the United States, Canada and Mexico) and a common statistical framework to facilitate analysis of the three economies. NAICS Canada replaced both the 1980 Standard Industrial Classification and the 1980 Canadian Standard Industrial Classification for Companies and Enterprises.

Data quality

2006 Census of Agriculture — concepts, methodology and data quality

Using the following information will ensure a clear understanding of the basic concepts that define the data provided in this product, and of the underlying census methodology and key aspects of the data quality. It will give you a better understanding of how the data can be effectively used and analysed according to their strengths and limitations.
The information may be particularly important when making comparisons with data from other surveys or sources of information, and in drawing conclusions regarding change over time.

Data sources and methodology

The Census of Agriculture collects and disseminates a wide range of data on the agriculture industry such as number and type of farms, farm operator characteristics, business operating arrangements, land management practices, crop areas, numbers of livestock and poultry, farm capital, operating expenses and receipts, and farm machinery and equipment. These data provide a comprehensive picture of the agriculture industry across Canada every five years at the national, provincial and territorial levels as well as at lower levels of geography.

General methodology

Target population

The target population is all census farms in Canada. In 2006, a census farm was defined as an agricultural operation that produces at least one of the following products intended for sale: crops (hay, field crops, tree fruits or nuts, berries or grapes, vegetables, seed); livestock (cattle, pigs, sheep, horses, game animals, other livestock); poultry (hens, chickens, turkeys, chicks, game birds, other poultry); animal products (milk or cream, eggs, wool, furs, meat); or other agricultural products (Christmas trees, greenhouse or nursery products, mushrooms, sod, honey, maple syrup products). However, the definition of a census farm has changed over time.

The Census of Agriculture also collects and disseminates data pertaining to a related sub-population — farm operators. In 2006, "farm operators" was defined as those persons responsible for the day-to-day management decisions made in the operation of a census farm or agricultural operation. Up to three farm operators could be reported per farm. Prior to the 1991 Census of Agriculture, the farm operator referred to only one person responsible for the day-to-day decisions made in running an agricultural operation.

Collection

In 2006, a Census of Agriculture questionnaire was dropped off along with a Census of Population questionnaire when someone in the household was a farm operator. Once completed, the questionnaire was mailed back for editing. If it was determined that a questionnaire had not been received, or if data were missing, a follow-up was conducted by telephone or personal visit.

Data processing

Once the questionnaires were received at head office they were registered, electronically scanned and the data automatically captured from the image using intelligent character recognition (ICR) technology. The captured data were then subjected to many rigorous quality control and processing edits to identify and resolve problems related to inaccurate, missing or inconsistent data. Subject-matter analysts also reviewed the aggregated data and individual values so that any remaining errors due to coverage, misreporting, data capture or other reasons were identified and corrected.

Reference period

The Census of Agriculture has been conducted concurrently with the Census of Population every five years since 1951. The 2006 Census of Agriculture was conducted on May 16, 2006.

Revisions

Data from the Census of Agriculture are not subject to revision.

Adjustments

Data from the Census of Agriculture are not subject to seasonal adjustments or benchmarking to other data sources.

Data accuracy

An integral part of each Census of Agriculture is the implementation of new or enhanced methods, procedures and technologies that improve not only the collection, but also the processing, validation and dissemination of the data. New methods, procedures and technologies adopted for the 2006 Census of Agriculture included mailing questionnaires to the 6.5% of the farm population with a recognized mailing address, the option of completing the questionnaire online, and two follow-up surveys: the Missing Farms Follow-up Survey and the All-purpose Farms Follow-up Survey. In addition, to help ensure that data from the 2006 Census of Agriculture would be of consistently high quality, improved quality assurance and control procedures were incorporated into each of the collection and data processing stages.

Primarily as a result of adopting these methods, procedures and technologies, the 2006 Census of Agriculture data are of very good quality, with data for the major commodities being of the highest quality. A response rate of 95.7% and an estimated 3.4% undercoverage rate of farms indicate the overall success of the 2006 Census of Agriculture. Note that over half of the estimated undercoverage was of farms with sales below $10,000 in 2005. As a result, the undercoverage rate for major commodities is below 2%.

With projects as large and complex as the Censuses of Agriculture and Population, the estimates produced from them are inevitably subject to a certain degree of error.
Knowing the types of errors that can occur and how they affect specific variables can help users assess the data's usefulness for their particular applications as well as assess the risks involved in basing conclusions or decisions on them.

Errors can arise at virtually every stage of the census process, from preparing materials, through collecting data, to processing. Moreover, errors may be more predominant in certain areas of the country or vary according to the characteristic being measured. Some errors occur at random, and when individual responses are aggregated for a sufficiently large group they tend to cancel each other out. For errors of this nature, the larger the group, the more accurate the corresponding estimate. For this reason, data users are advised to be cautious when using estimates based on a small number of responses. Some errors, however, might occur more systematically and result in "biased" estimates. Because the bias from such errors is persistent no matter how large the group for which responses are aggregated, and because bias is particularly difficult to measure, systematic errors are a more serious problem for most data users than random errors.

The most common types of errors are described below.

Coverage errors

In spite of efforts by census representatives to locate and enumerate all farm operations in Canada, each Census of Agriculture misses some farms, primarily because of the difficulty in correctly identifying an agricultural operation when none of its farm operators live on or near it. To reduce undercoverage, census representatives are instructed to ask a member of every household whether someone in the household is a farm operator. In addition, since 1991, an agriculture operator screening question has been on the Census of Population questionnaire to identify farm operators missed when the questionnaires were delivered. If a Census of Population questionnaire was returned with this question marked "yes," the Missing Farms Follow-up Survey called those households by phone to complete a Census of Agriculture questionnaire. This survey also made it possible to identify all large farms in each province on Statistics Canada's Farm Register (a regularly updated listing of farms in Canada) that may have been missed by the Census of Agriculture. The operators of these farms were contacted by phone to complete the questionnaire. Finally, the Coverage Evaluation Survey gave an estimated 3.4% undercoverage rate for the 2006 Census of Agriculture.

Non-response errors

Some Census of Agriculture and Census of Population questionnaires are only partially completed or not completed at all, usually because of the respondent's absence during the census period or unwillingness to complete the questionnaires. In either case, if the follow-up attempt to obtain the appropriate information is unsuccessful, missing responses are approximated using an automated imputation procedure during data processing. This procedure replaces a missing or inconsistent response, either with a value that is consistent with the other data provided on the questionnaire or with a response obtained from a similar agricultural operation. Data resulting from this procedure generally have little impact on the final figures released.

Response errors

Respondents sometimes provide inaccurate responses on the questionnaire, perhaps as a result of misinterpretation of a question, incorrect placement of a response or approximation of a response. In the Census of Agriculture, implausible or inconsistent responses are confirmed or corrected by contacting the respondents, since they could have a significant impact on totals at either the provincial or the sub-provincial level.

Processing errors

Errors can arise at any stage of data processing, including scanning or character recognition errors during data capture, manual coding and classification errors, and errors due to limitations in the imputation procedure (to correct missing or inconsistent responses, as described in "Non-response errors"). A detailed set of computerized checks at each stage of processing identifies such errors for corrective action. In addition, quality assurance procedures were developed for all processing steps.

Comparability of data and related sources

The data validation process identified some instances in which data either were not directly comparable to those from previous censuses or were of reduced quality, primarily because of coverage or response errors. After thoroughly investigating each case, notes were developed to identify the variables affected and explain the situation associated with each.

Following each Census of Agriculture, other agricultural surveys use Census of Agriculture data as a basis, or benchmark, for the production of regularly published estimates of the agriculture industry.

Other quality indicators and assessments

Coverage Evaluation Survey

The purpose of the Coverage Evaluation Survey (CES) is to estimate the coverage of the 2006 Census of Agriculture that was conducted on May 16, 2006.

Coverage is a problem that affects the quality of estimates of all censuses. For the Census of Agriculture, coverage errors occur when farms are missed, incorrectly included or double counted. The CES measures the level of coverage and is one way to assess the quality of the Census of Agriculture estimates.

The CES selects a random sample of smaller farm operations from Statistic Canada's Farm Register for which no Census of Agriculture questionnaire was received. The CES also draws a random sample of households not contacted by the Missing Farms Follow-up Survey but that had identified a farm operator as part of the household yet had not completed a Census of Agriculture questionnaire. The survey uses a short questionnaire to collect key information about the operating status and the size of the farm.

Please note that there are no estimates of undercoverage for Yukon Territory, the Northwest Territories and Nunavut.

Table 1. Farm undercoverage: breakdown by province

Province	Enumerated farms	Non-enumerated farms (estimated)	Undercoverage	Standard Error
Newfoundland and Labrador	558	37	6.60%	1.50%
Prince Edward Island	1,700	51	3.00%	0.60%
Nova Scotia	3,795	258	6.80%	0.90%
New Brunswick	2,776	209	7.50%	1.10%
Quebec	30,675	494	1.60%	0.20%
Ontario	57,211	1,870	3.30%	0.30%
Manitoba	19,054	543	2.80%	0.20%
Saskatchewan	44,329	922	2.10%	0.10%
Alberta	49,431	2,145	4.30%	0.10%
British Columbia	19,844	1,310	6.60%	0.30%
Canada	229,373	7,839	3.40%	0.10%

Table 2. Total farm area undercoverage: breakdown by province/region

Province/region	Enumerated farms	Non-enumerated farms (estimated)	Undercoverage	Standard Error
Atlantic	2,681,898	73,971	2.80%	0.50%
Quebec	8,557,101	72,424	0.80%	0.10%
Ontario	13,310,216	194,783	1.50%	0.30%
Manitoba	19,073,005	233,742	1.20%	0.30%
Saskatchewan	64,253,845	627,669	1.00%	0.10%
Alberta	52,127,857	866,096	1.70%	0.10%
British Columbia	7,006,569	106,625	1.50%	0.20%
Canada	167,010,491	2,175,310	1.30%	0.10%

Table 3. Total gross farm receipts undercoverage: breakdown by province/region

Province/region	Enumerated farms	Non-enumerated farms (estimated)	Undercoverage	Standard Error
Atlantic	1,498,996,526	14,975,511	1.00%	0.40%
Quebec	7,397,699,035	51,761,280	0.70%	0.20%
Ontario	10,342,031,229	59,266,351	0.60%	0.10%
Manitoba	4,073,912,291	23,328,858	0.60%	0.20%
Saskatchewan	6,338,334,378	59,471,714	0.90%	0.20%
Alberta	9,889,044,545	129,211,505	1.30%	0.30%
British Columbia	2,651,963,167	22,922,161	0.90%	0.10%
Canada	42,191,981,171	360,937,380	0.90%	0.10%

Table 4. Farm undercoverage: breakdown by total gross farm receipts

Total gross farm receipts	Enumerated farms	Non-enumerated farms (estimated)	Undercoverage	Standard Error
0 to $9,999	50,138	4,228	8.40%	0.30%
$10,000 to $24,999	38,254	1,405	3.70%	0.30%
$25,000 to $99,999	62,030	1,257	2.00%	0.10%
$100,000 to $249,999	39,971	644	1.60%	0.10%
Greater than or equal to $250,000	38,980	305	0.80%	0.10%