THE UNITED STATES OF AMERICA[1] – CENSUS OF AGRICULTURE 2022 – METADATA REVIEW

1. Historical outline

The first census of agriculture (CA) in the United States of America was conducted in 1840 as part of the sixth decennial census of population. After the 1920 census, the census interval was changed from the decennial period to every five years until 1945. The CA continued to be implemented as part of the decennial census through 1950. From 1954 to 1974, the census took place in the years ending in 4 and 9. In 1976, Congress changed the five-year data collection cycle to years ending in 2 and 7, to coincide with other economic censuses, cycle that continues to this day, except in 1977 when the census was carried out in 1978. The CA 2022 was the 30th Federal census of agriculture and the sixth to be conducted by the National Agricultural Statistics Service (NASS) of the United States Department of Agriculture (USDA).

2. Legal basis and organization

Legal framework

The CA is required by law under the Census of Agriculture Act of 1997, Public Law 105-113 (Title 7, United States Code, Section 2204g). The law directs the Secretary of Agriculture to conduct a CA every five years. The CA includes each State.

Institutional framework and international collaboration

The NASS of the USDA is the government agency with responsibility for the CA.[2] Farmers are required by the CA Act to respond to the CA. Various USDA agencies and State departments of agriculture provided advice during the planning, data collection, and processing phases of the census, as well as critical assistance at the local level to farmers and ranchers completing census questionnaires. The Advisory Committee on Agriculture Statistics offered advice on census questions, as well as their support and recommendations for census and other programs. Representatives of public and private organizations provided input as well.

Census staff

The staff involved in census activities consisted of 539 NASS employees.

3. Reference date and period

Reference day: 31 December 2022 for stock items such as livestock, machinery and equipment inventories, market value of land and buildings.

Reference period: from 1 January to 31 December 2022, for items such as on crops and land areas, crop and livestock sales, other farm-related income, direct sales income, Commodity Credit Corporation loans, hired farm labour, use of pesticides, fertilisers and irrigation, and farm expenses.

4. Enumeration period

The CA 2022 data collection was conducted from November 2022 to May 2023. Due to the COVID-19 pandemic, NASS experienced some changes to its normal operating procedures, but was able to mitigate those changes without significant program impacts. Therefore, census activities were not affected by the pandemic and no delays or postponements occurred, including in the United States Territories and Outlying Areas.

5. Scope of the census and definition of the statistical unit

The **census scope** covered agricultural activities (crop and livestock production).

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[1] The census results related to the United States of America bear only upon the continental territory of the country (without considering U.S. Territories and Outlying Areas).
[2] The U.S. Department of Commerce, Bureau of the Census conducted the census of agriculture for 156 years (1840-1996). The 1997 Appropriations Act contained a provision that transferred the responsibility for the census of agriculture to NASS.

The **statistical unit** for the CA 2022 was the farm, an operating unit defined as any place from which USD 1 000 or more of agricultural products were produced and sold, or normally would have been sold, during the census year.[3]

Community-level data

There were no community-level data collected along with the census.

6. Census coverage

Geographic coverage

The CA 2022 covered the continental territory of the country.

Cut-off threshold and other exclusions

The agricultural operations that did not produce and sell USD 1 000 or more of agricultural products during the census year, or did not have the potential, were excluded from the CA.

7. Methodology

Methodological modality for conducting the census

The classical approach was used in the CA 2022.

Relation to other censuses

As part of its CA Program, NASS conducted special studies which provided more detailed data on a particular subject area. Following the CA 2022, NASS conducted or will conduct the 2023 Census of Aquaculture, 2023 Irrigation and Water Management Survey, 2024 Census of Horticultural Specialties, 2024 Tenure, Ownership, and Transition of Agricultural Land (TOTAL) Survey, 2025 Organic Survey, and 2025 Local Food Marketing Practice Survey.

Frames

NASS compiles and maintains a list of farmers and ranchers that constitutes the Census Mail List (CML). The CML compilation begins with the list used to define sampling populations for NASS surveys conducted for the agricultural estimates program. NASS builds and improves the list on an ongoing basis by obtaining outside source lists such as State and federal government lists, producer association lists, seed grower lists, pesticide applicator lists, veterinarian lists, marketing association lists, and a variety of other agriculture-related lists, and special commodity lists to address specific list deficiencies. For CA 2022, NASS worked with community-based organizations not only to improve list coverage for minorities but also to increase census awareness and participation. List building activities for developing the CML 2022 started in 2019 by updating list information from respondents to the CA 2017. Between 2017 and 2022, NASS conducted a series of National Agricultural Classification Surveys (NACS) on over 2.1 million records, which included nonrespondents from the 2017 census and newly added records from outside list sources.

NASS used its June Area Survey (JAS) to quantify the number and types of farms not on the CML. The records in the JAS that were not on the CML were in the Not-on-the-Mail List (NML) domain. If a JAS record in the NML domain was determined to be a farm during the census, it was an NML farm. The NML farms were used to measure coverage associated with the grown crops, farm numbers, and inventories of cattle. The 2022 JAS sample was increased to improve the farm counts for operations that produced specialty commodities or had socially disadvantaged or minority producers. The initial NML mailout consisted of 41 273 records. A total of 40 775 NML records were analysed, of which 1 913 records were confirmed to be NML and in-scope. The CML was used with the NML in a capture-recapture framework to represent all farming operations across all States in the JAS sample. More detailed information can be found in the Appendix A - Census of Agriculture Methodology - of the 2022 Census Full Report available at https://www.nass.usda.gov/Publications/AgCensus/2022/Full_Report/ Volume_1,_Chapter_1_US/usappxa.pdf.

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[3] The definition has changed nine times since it was established in 1850. The current definition was first used for the 1974 CA. This definition is consistent with the definition used for current USDA surveys. The farm definition used for each U.S. territory varies.

Complete or/and sample enumeration methods

The CA 2022 was conducted using complete enumeration.

Sample design

No sampling was used.

Data collection methods

Data collection was accomplished primarily through mail-out/mail-back and CAWI methods. CATI and CAPI methods were used for special classes or records in the census operation. For the CA 2022, NASS implemented a pre-notification strategy to increase awareness, improve overall responses, and encourage respondents to report early to avoid continued correspondence. Census data collection began on 22 November 2022 when nearly all producers on the CML received a letter inviting them to report online. They received a unique survey code and instructions for completing their census online. The letter encouraged producers to report online early to avoid receiving mail and phone follow-ups. Mail packets were mailed in December 2022. Different reminders and follow-up mail packets were sent from January to March 2023. A final mailing was sent to non-respondents with a short questionnaire designed to primarily determine if the operation was a farm or not in business.

Questionnaire(s) and items covered

The CA 2022 used four versions of the questionnaire: (i) General form (22 – A100); (ii) Hawaii form (22 – A101); (iii) American Indian form (22 – A300); and (iv) Farm Status form (22 – A400). The general form facilitated reporting crops and livestock most commonly grown and raised in the U.S. The farm status form expedited reporting specific crops or livestock for preidentified farms and ranches in the U.S. The Hawaii form targeted crops and livestock specifically grown or raised on farms and ranches in Hawaii. The American Indian form focused on crops and livestock for farms and ranches on reservations in Arizona, New Mexico, and Utah. The questionnaires covered 16 out of the 23 essential items recommended in the WCA 2020.[4]

8. Use of technology

CAWI, CAPI and CATI methods were used for census data collection. Optical scanning was used for data capture of mailed paper questionnaires. An online database enabled users to retrieve customized tables with census data at the national, state and county level.

9. Data processing

Direct data capture was ensured by the CAWI, CATI and CAPI methods. The complete questionnaires received by mail were scanned and an Optical Mark Recognition (OMR) was used to capture categorical responses and other answer zones in which some type of mark was present. Data entry operators keyed data from the scanned images using OMR results that highlighted the areas of the report forms with respondent entries. The keyer evaluated the contents and captured pertinent responses. Ten percent of the captured data were keyed a second time for quality control. Captured data were processed through a computer formatting program that verified that records were valid. Rejected records were referred to analysts for correction. Accepted records were sent to a complex computer batch edit process. The computer edit determined whether a reporting operation met the qualifying criteria to be counted as a farm (in-scope). The edit systematically checked reported data section-by-section with the overall objective of achieving an internally consistent and complete report. The edit determined the best value to impute for reported responses that were deemed unreasonable and for required responses that were absent. Multiple sources were used for imputation including previously reported data and administrative data from the Farm Service and other USDA agencies. Additionally, as 2022 records were processed, they were added to the donor pools. When deterministic edit logic and previously reported data sources were unable to provide a current value, data from a reporting farm of similar type, size, and location were considered. In cases where automated imputation was unable to provide a consistent report, the record was referred to an analyst for resolution. After tabulation and review of the aggregates, a comprehensive disclosure review was conducted. Farm

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[4] The following essential items were not covered: (i) 0107 Main purpose of production of the holding; (ii) 0407 Number of permanent crop trees in scattered plantings (for each tree crop); (iii) 0501 Type of livestock system; (iv) 0503 Number of female breeding animals; (v) 0801 Household size by sex and age groups; (vi) 0901 Whether working on the holding is the main activity; and (vii) 0902 Working time on the holding.

counts were not considered sensitive and were not subject to disclosure controls. Cell suppression was used to protect the cells that were determined to be sensitive to a disclosure of information.

10. Quality assurance

NASS conducted an extensive program to follow-up all non-responses. NASS also used capture-recapture methodology to adjust for under-coverage, non-response, and misclassification. For the CA 2022, the capture-recapture methodology was used to model the probability of capture with a single model, thereby allowing the utilization of all census responses and JAS records in the adjustments. To implement capture-recapture methods, two independent samples were considered: the CA 2022 (based on the CML) and the JAS 2022 (based on the area frame).

11. Data and metadata archiving

Data was published on 13 February 2024 and is available at https://www.nass.usda.gov/Publications/AgCensus/2022/index.php. Microdata will be available after the publication of all census products. NASS's metadata archiving and data storage for data collection and publication is the Metadata Repository System (MRS). The MRS is a MySQL database containing tables that hold and archive micro (for data collection) and macro (for publication) level metadata.

12. Data reconciliation

There was no reconciliation process of CA 2022 data.

13. Dissemination of census results and microdata

Final report was published on 13 February 2024. The complete results of the CA 2022 are available in the NASS website (available at https://www.nass.usda.gov/Publications/AgCensus/2022/index.php) in different formats, including a comprehensive summary of agricultural activity for each state and its counties, or county equivalent; Quick Stats 2.0, the CA 2022 database to retrieve customized tables with Census data at the national, state, and county levels; the complete CA 2022 census data set; and the CA highlights, a series of topical fact sheets about the characteristics, conditions and trends among U.S. farms and farmers. More online resources, such as the CA web maps and the zip code tabulations, will be available in the second half of 2024. Different subject series reports will be published: Watersheds, American Indian Reservations and Specialty Crops, in 2024; and Typology (of farms) in 2026. From May to June 2024, different rankings and profiles will be published.

NASS allows eligible researchers the opportunity to gain access to restricted microdata files through a standard application process (SAP). Applications for access to the CA 2022 restricted microdata will be accepted following publication of all census products. The CA 2022 will be available in the SAP around 1 August 2024.

14. Data sources

United States Department of Agriculture, National Agriculture Statistics Service (USDA, NASS). 2024. Census of Agriculture. In: *USDA, NASS* [online]. United States. [Cited 8 March 2024]. https://www.nass.usda.gov/Publications/AgCensus/2022/index.php

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