Food and Agriculture Organization of the United Nations

PUERTO RICO – Census of Agriculture 2018 – Metadata review

Puerto Rico is one of the territories collectively referred to as "U.S. Outlying Areas". For statistical purposes, it is recorded as a separate entity in the World Census of Agriculture Database (in the Americas Region). Consequently, the results related to the United States of America bear only upon the continental territory of the country.

1. Historical outline

The first Census of Agriculture (CA) in the Commonwealth of Puerto Rico was conducted in 1910. From that year to 1950, a CA was taken every ten years, in conjunction with the decennial censuses of population. Later, the timing was adjusted, such that the CA is conducted on the basis of a five-year data collection cycle, covering the years ending in 2 and 7. The CA 2002 for Puerto Rico was the first to be taken on a calendar-year basis, followed by the one conducted in 2012 bringing the Puerto Rico census in line with the United States of America; subsequent censuses continue to be done on a calendar basis. The present metadata review and data refers to the CA 2018, initially planned for 2017. On 20 September 2017 hurricane Maria devastated Puerto Rico. Due to the lack of the communication infrastructure necessary to continue with census activities NASS decided to delay the 2017 Puerto Rico Census of Agriculture for a whole year to give farmers and government agencies time to recover from such massive devastation.

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 census of agriculture every five years. The CA 2018 was conducted in accordance with a Cooperative Agreements approved by the Director of the Census and Survey Division of National Agricultural Statistics Service (NASS) of the U.S. Department of Agriculture (USDA) and by the Secretary of the Puerto Rico Department of Agriculture, the College of Agricultural Science of the University of Puerto Rico, and the Cooperative State Research, Education, and Extension Service.

Institutional framework and international collaboration

The census data for Puerto Rico were collected in accordance with a Memorandum of Agreement approved by the Administrator of NASS of the USDA and by the President of the Puerto Rico Planning Board. The census was conducted with the cooperation and assistance of the Puerto Rico Department of Agriculture (DA), the University of Puerto Rico, and the Cooperative State Research, Education, and Extension Service. The NASS provided technical assistance at various levels, while the DA of Puerto Rico was responsible for recruiting and training local officers and field staff and supervising local administrative matters.

Census staff

The CA 2018 in Puerto Rico employed one project manager, two crew leaders/supervisors, and 95 enumerators and they received special training in accordance with instructions prepared by NASS. The training included practice in interviewing and filling out the report form plus detailed discussion of the enumerator's instructions.

3. Reference date and period

***Reference day*:** 31 December 2018 for inventory items such as livestock, machinery, equipment, buildings, facilities on farms and operator's characteristics.

Reference period: the calendar year (from 1 January to 31 December 2018), for crop production, crop and livestock sales, and expense data.

4. Enumeration period

The enumeration period was from 1 January to 31 December 2019.

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

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

The ***statistical unit*** is a farm, defined as a place from which USD 500 or more of agricultural products were produced and sold, or normally would had been sold, during the 12-month period between 1 January and 31 December 2018. The statistics collected in the census relate to places with agricultural operations qualifying as farms according to the census definition.

Community-level data

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

6. Census coverage

Geographic coverage

The CA covered the entire country.

Cut-off threshold and other exclusions

The following minimum size limit was used to include units in the census: USD500 or more of agricultural products were produced and sold, or normally would have been sold, during the census year.

7. Methodology

Methodological modality for conducting the census

The classical approach was used in the CA 2018.

Relation to other censuses

No relationship with other censuses.

Frame

The Puerto Rico CA 2018 was conducted using a multiple frame approach, consisting of a list frame and an area frame.[1]

Complete and/or sample enumeration methods

The CA 2018 was a complete enumeration. A report form was sent to farm operators on the census mail list (CML). This was supplemented by an area sample, which accounted for farms Not-on-the-Mail-List (NML).[2]

Sample design (if sampling was used)

From the initial CML of 21 378 names and addresses stratified by size and type of farm, equal weighting was applied to responding farms and non-responding farms, computed by response homogeneity group (RHG). Records found to be undeliverable were excluded from the nonresponse calculations. Farms not included in the CML were sampled in an area frame.[3]

Data collection method(s)

Data collection was accomplished primarily through the mail-out/mail-back method. The list was mailed with a census report form. Those that did not respond to this first report form received a second report form in the post. Enumerators from the DA and the Extension Service conducted a field follow-up, to

[1] Every address on the census list was posted a report form except for certain special records, which were enumerated face to face. This was achieved by combining the information extracted from the Census Mail List (CML) in the PHC provided by the Puerto Rico DA and the area sample survey, which was conducted to identify the farms not listed on the CML.

[2] Of approximately 7 500 segments available for sampling, 300 segments were selected. All NML farms discovered within the 300 sampled segments were included in the area sample. This ensured that complete enumeration was achieved.

[3] NASS stratified the area frame based on agricultural intensity with strata. An additional sampling enhancement involved the grouping of municipalities with similar agriculture into nine clusters. Within each stratum and cluster, a random sample of PSUs was selected and then further subdivided into target sampling units called segments. During the pre-screening process, 462 NML farm operators were found in the 300 sampled area segments; however, only 47 of these original NML records were determined to be actual farm operators. Enumerators used aerial photos and municipal maps to identify all farm operators within each assigned area segment.

visit and enumerate operations that did not respond by post. Farmers returned the completed form to the National Processing Centre (NPC) in Jeffersonville, Indiana, for processing. A Computer-Assisted Self-Interviewing (CASI) instrument was also available for operators who preferred to report online. A letter with a unique survey code and instructions for completing their census online was included in each mail package.

Questionnaire(s) and items covered

One questionnaire (reporting form) was used for the CA 2018.[4] The CA 2018 covered 17 out of the 23 essential items recommended in the WCA 2020.[5]

8. Use of technology

Optical scanning was used to capture data from the paper questionnaires. A CASI instrument was also used by operators who preferred to report online. An online database enables users to retrieve customized tables with census data at the national, state and county level.

9. Data processing

The report forms returned were automatically checked in by scanning devices that identified each case referring to the barcode in the address label of the form. Data were retrieved from the returned forms using optical scanning. Missing data were supplied on the basis of similar farms and were assigned farm classification codes, which were necessary for tabulating the data. Data from each report were subjected to a detailed item-by-item computer edit.

10. Quality assurance

Ten percent of the captured data were keyed a second time for quality control. If differences existed, an adjudicator handled resolution. This was used to grade the performance of the keyers, who were required to maintain a certain accuracy level or receive additional training. The measured error rate for the entire survey was 0.27 percent.

A Post enumeration survey was not carried but data collected were sampled to determine the total sampling error. The total sampling error was derived from the estimate of the NML component using an area frame and assumptions were used to allocate equal weights to respondents and non-respondents in the CML component. The NML and CML components were combined to provide a single estimate. The estimate reflects complete and unduplicated coverage, provided that nonresponse bias and non-sampling errors are not operative.

In CA 2018, efforts were made to measure error associated with the adjustments for farm operations that were not on the CML, for farm operations that were on the CML but did not respond to the census report form, and for farms and non-farms that were misclassified as non-farms and farms, respectively, and for calibration. This error measurement was developed from the standard error of the estimates at the island and regional levels and were expressed as coefficient of variation (CV). Every estimate has a corresponding CV published with it.

11. Data and metadata archiving

Completed report forms were automatically checked in by scanning devices that identified each case by the bar code in the address label of the form. The report forms were then scanned to create images used for data keying. Missing data were supplied based on similar farms and assigned farm

[4] The reporting form was prepared by NASS, in cooperation with the Planning Board and the Inter-Agency Working Group, which included members of the Puerto Rico DA, the College of Agricultural Sciences at the University of Puerto Rico, Mayaguez Campus (RUM), the Extension Service, and other data users.

[5] The following essential items were not covered: (I) 0407 Number of permanent crop trees in scattered plantings (for each tree crop); (ii) 0411 Use of each type of fertilizer; (iii) 0501 Type of livestock system; (iv) 0503 Number of female breeding animals; (v) 0601 Use of agricultural pesticides; (vi) 0801 Household size by sex and age groups.

classification codes necessary for tabulating the data. Data from each report were subjected to a detailed item-by item computer edit.

12. Data reconciliation

There was no reconciliation process of CA 2018 data.

13. Data dissemination of census results and microdata

The census data are publicly available at the website of the United States Department of Agriculture (see section 14). Users may choose between the Spanish and English versions.

14. Data sources

United States Department of Agriculture, National Agriculture Statistics Service (USDA, NASS). 2020. Census of Agriculture. In: *USDA, NASS* [online]. Washington, D.C. [Cited 18 February 2023]. https://www.nass.usda.gov/Publications/AgCensus/2017/.

United States Department of Agriculture, National Agriculture Statistics Service (USDA, NASS). 2020. *2017 Census of Agriculture, Puerto Rico, Island and Regional Data, Volume 1*, Geographic Area Series Part 52. Washington, D.C., United States of America. (also available at https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Outlying_Areas/Puerto_Rico/prv1.pdf)

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