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## United States of America - Census of Agriculture 2012 - Explanatory notes

### Historical Outline

A national census of agriculture was first taken in 1840 and was conducted every 10 years thereafter until 1920. Since 1982, the Census of Agriculture has been conducted on a 5 - year cycle for years ending in 2 and 7. The 2012 Census of Agriculture is the 28<sup>th</sup> Federal census of agriculture and the fourth conducted by the United States Department of Agriculture's National Agricultural Statistics Service (NASS).

### Legal Basis and Organization

The National Agricultural Statistics Service of the United States Department of Agriculture is the government agency with responsibility for the Census of Agriculture. Farmers are required by law to respond to the Census of Agriculture under Title 7, United States Code, Section 2204g.

### Reference Period or Date

December 31, 2012 was the reference date for those characteristics such as livestock, poultry and the value and inventory of farm machinery and equipment for which a single date would be applicable. The reference year 2012 was used for crop and land areas, farm labor, financial information and agricultural production methods.

### Enumeration Period

Questionnaires and instructions were mailed in December 2012 and respondents were informed that their reports were due February 4<sup>th</sup> 2013. Pre-notification by postcard or pre-recorded message began December 10, 2012. Approximately 3.0 million mail packets were mailed in December 2012. Each packet contained a cover letter, instruction sheet, a labeled report form, and a return envelope addressed to the Census Bureau's National Processing Center.

### Definition of the Statistical Unit

The United States defines an agricultural holding (farm, ranch or other agricultural business activity) as an operation/holding that produces and sells, or would normally sell, \$1,000 or more of agricultural products per year.

### Geographic Coverage

All of the country and Puerto Rico

### Statistical Coverage and Questionnaire Content

#### Questionnaire Content

The Census of Agriculture collects information on land use, land area of food, feed, fibre and horticulture crops, net income, operator and type of organization, production and sales of agricultural products during 2012, inventory of livestock, poultry, and other animals and many other farm-related items.

#### Exclusions and Cut-Off Thresholds

Agricultural holdings that do not normally produce and sell \$1,000 or more of agricultural products per year or do not have the potential are not tabulated as farms.

### Frame

The United States National Agricultural Statistics Service (NASS) maintains a list of farmers and ranchers from which the Census Mail List (CML) is compiled. 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. Sources include 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. NASS also obtains special commodity lists to address specific list deficiencies.

An independent area frame is used to estimate the undercoverage associated with the census. The annual June Agricultural Survey is the source of the area frame records.

### Methodology

Use of the FAO Modular Approach

No

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#### Questionnaire(s)

There were seven regionalized versions of the report forms (questionnaires) used for the 2012 Census of Agriculture. The report form versions were designed to facilitate reporting crops most commonly grown within each report form region. Additionally, an American Indian report form was developed to facilitate reporting for operations on reservations in Arizona, New Mexico, and Utah. All of the forms allowed respondents to write in specific commodities that were not listed on their form.

#### Enumeration of all Agriculture Households or Sample

The Census of Agriculture was an enumeration of all known agricultural holdings meeting the United States Department of Agriculture's definition of a farm. There was no sampling.

#### Sample Design

The Census of Agriculture was an enumeration of all known agricultural holdings and there was no sampling.

#### Sample Selection

There was no sampling.

#### Collection Method

Mail-out and mail-back was the primary data collection method. It was supplemented with Electronic Data Reporting on the Internet and non-response follow-ups by telephone and personal enumeration.

#### Controls to Minimize Non-Sampling Errors

Extensive efforts were made to compile a complete and accurate mail list for the census, to elicit response to the census, to design an understandable report form with clear instructions, to minimize processing errors through the use of quality control measures, to reduce matching error associated with the capture-recapture estimation process, and to minimize error associated with identification of a respondent as a farm operation (referred to as classification error). The weight adjustment and tabulation processes recognize the presence of non-sampling errors; however, it is assumed that these errors are small and that, in total, the net effect is zero. In other words, the positive errors cancel the negative errors.

#### Data Entry, Edits and Imputations, Estimation and Tabulation

All report forms returned to the National Processing Centre were immediately checked in, using bar codes printed on the mailing label, and removed from follow-up mailings. All forms with any data were scanned and an image was made of each page of a report form. Optical Mark Recognition (OMR) was used to capture categorical responses and to identify the 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.

Captured data were processed through a computer formatting program, which verified that records were valid – that the record identification number was on the list of census records, that the reported counties of operation and production were valid, and other related criteria. Rejected records were referred to analysts for correction. Accepted records were sent to a complex computer batch edit process. The edit systematically checked reported data section-by-section with the overall objective of achieving an internally consistent and complete report. NASS subject-matter experts had previously defined the criteria for acceptable data. Problems that could not be resolved within the edit were referred to an analyst for intervention.

The edit system determined the best value to impute for reported responses that were deemed unreasonable and for required responses that were absent. If an item could not be calculated directly from other current responses, the edit determined whether acreage, production or inventory items had been reported for that farm on a recent NASS crop or livestock survey. The imputed data were then validated by the same edit logic to which reported data were subject. Since imputation was conducted independently for each occurrence, reports requiring multiple imputations may have drawn from multiple donors.

The complex edit ensured the full internal consistency of the record. Successfully completing the edit did not provide insight as to whether the report was reasonable compared to other reports in the county. Therefore, analysts were provided an additional set of tools, in the form of listings and graphs,

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to review record-level data across farms. These examinations revealed extreme outliers, large and small, or unique data distribution patterns that were possibly a result of reporting, recording, or handling errors. Potential problems were researched and, when necessary, corrections were made and the record interactively edited again.

After tabulation and review of the aggregates, a comprehensive disclosure review was conducted. NASS is obligated to withhold, under Title 7, U.S. Code, any total that would reveal an individual's information or allow it to be closely estimated by the public. Cell suppression was used to protect the cells that were determined to be sensitive to a disclosure of information. Farm counts are not considered sensitive and are not subject to disclosure controls.

#### Innovative Methodologies

Although the Census of Agriculture does not inherently rely on a sample, it uses statistical procedures in compiling the Census Mail List, in its data collection procedures, in data editing and processing, and in compiling the final data. Additionally, it uses statistical procedures to both measure errors in the various processes and in making adjustments for those errors in the final data. One example is the statistical process used to account for under-coverage, non-response of farms on the Census Mail List, and misclassification of responses to the census. The basis of the under-coverage adjustment is the capture-recapture procedure that uses the area sample enumeration from the June Agricultural Survey. The largest contribution to error in the census estimates is due to the adjustments for nonresponse, under-coverage, misclassification, calibration and integerization.

#### Post Census Techniques to Check and Validate Census Data Quality

NASS conducted an extensive program to follow-up all non-response. NASS also used capture-recapture methodology to adjust for under-coverage, non-response, and misclassification. To implement capture-recapture methods, two independent surveys were required - the 2012 Census of Agriculture (based on the Census Mail List) and the 2012 June Agricultural Survey (based on the area frame). Historically, NASS has been careful to maintain the independence of these two surveys.

#### Data Dissemination and Use

The complete data series from the 2012 Census of Agriculture is available from the NASS website free of charge in multiple formats, including Quick Stats 2.0 – an online database to retrieve customized tables with Census data at the national, state and county levels. The 2012 Census of Agriculture provides information at the national, state and county levels and includes data on a range of topics, including agricultural practices, conservation, organic production, as well as traditional and specialty crops.

The Census provides the only source of uniform, comprehensive and impartial agriculture data down to the county level. Conducted only once every five years, the Census of Agriculture illustrates the power of data. Results from the Census inform smart policy-making that helps farmers and ranchers. The Census data provide the information to help shape programs and initiatives that benefit young and beginning farmers and ranchers, expand access to resources that help women, veteran and minority farmers and ranchers, and help farmers and ranchers diversify into new markets, including local and regional food systems, specialty crops and organic production.

#### Data Source

FAO ESS World Census of Agriculture 2010, Country Documents

[www.fao.org/economic/ess/ess-wca/wca-2010/countryinfo/en/](http://www.fao.org/economic/ess/ess-wca/wca-2010/countryinfo/en/)

[http://www.agcensus.usda.gov/Publications/2012/Full\\_Report/Volume\\_1,\\_Chapter\\_1\\_US/usv1.pdf](http://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_1_US/usv1.pdf)

(2012 Census of Agriculture, Geographic Area Series, U.S. Summary and State Data, AC-12-A-51, May 2014.)

[http://www.agcensus.usda.gov/Publications/2012/Full\\_Report/Outlying\\_Areas/prv1.pdf](http://www.agcensus.usda.gov/Publications/2012/Full_Report/Outlying_Areas/prv1.pdf)

(2012 Census of Agriculture, Geographic Area Series, Puerto Rico Island and Municipio Data, AC-12-A-52, June 2014.)

#### Mailing address / Census contact Points

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