BUL 1014

Women Farmers on the Rise? Understanding USDA Data-Collection Methods

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Introduction

Agriculture is a vital economic sector, so much so that various US offices throughout the nation's history have compiled data about its condition. The first report appeared in 1820 in the fourth national census. It contained information about the number of farms, ranches, and the people who operated them. By 1840, US marshals used separate schedules to collect agricultural data (United States Census Bureau 2021).

Since then, data-collection efforts have become more systematic. The United States Department of Agriculture (USDA) conducts a Census of Agriculture (CoA) every five years to learn more about "land use and ownership, operator characteristics, production practices, and [the] income and expenditures" of farmers and ranchers across the country (USDA National Agricultural Statistics Service 2021). It also provides the public with the data it collects in a variety of formats accessible through online databases and by special request.

One of the formats is Quick Stats. The data tool, often preferred by agricultural researchers and technical-assistance providers, is available on the USDA National Agricultural Statistics Service (NASS) website. Its extensive data enhances providers' ability to serve the needs of farmers and ranchers in their area. Yet changes in how the USDA NASS counts farmers have made it difficult to track the trends for a group that over the past decade has attracted increasing attention—women farmers. Given these statistical limitations, this publication aims to help you navigate the Quick Stats tool more effectively, so as to more accurately interpret trends involving farmers, particularly those who are women. After providing an overview of the USDA CoA and its data-gathering history regarding gender, we offer a summary of the different online platforms for accessing census data that will help to improve your ability to interpret Idaho's state and county-level census data.

What Is the Census of Agriculture?

Established in 1820, the CoA is an attempt to collect information about every farm in the United States. For most of its early years (between 1840 and 1920), the census was conducted by the US Census Bureau every ten years. Since 1997 it has occurred every five years under the stewardship of USDA NASS. The census count, however, does not include every farm (not every farm returns a survey), so the USDA uses a complex statistical weighting process to estimate actual farm numbers and their characteristics. After the USDA NASS releases the results of a CoA, state and county agencies often use the information to determine funding for related programs. You can access national, state, and county level data from current and past censuses free of charge from the USDA NASS website.

Data-Gathering Adjustments

Throughout the census's history, administrators have modified the data categories to capture changes in American agriculture. More recently, this includes adding new or removing existing survey questions each year, which affects the women farmer count. Acknowledging the increasing complexity of the industry workforce, the USDA CoA began to collect data on the gender of US farmers in 1978, adding other categories in the years that followed: from 1978 to 1997, single people qualified as a farm operator;[1] then in 2002 the CoA expanded that category, allowing up to three farm operators per farm (respondents were asked to select one person as the "principal operator or senior partner"); by 2017, the CoA made another adjustment, allowing up to four people to be listed as a "principal operator or senior partner."[2] The result is that more data on women farmers and ranchers between 1978 and 2017 is available, but the CoA's data-gathering methods complicate its accuracy. Thus, comparisons of women's roles in agriculture since 1978 remains challenging (Pilgeram et al. 2020).

Imperfect Gauges

The census changes since 1978 regarding farm operators and gender provide promising data, but taken at face value they are imperfect gauges for accurately estimating trends in the number of women operators and principal operators over time (including those of color and other groups) in US agriculture. Indeed, inconsistencies in the wording of the questions and the complexities inherent in variable definitions make comparisons over this period problematic, if not misleading. Hence, reports that rely on 2017 CoA data may identify erroneous trends about women in agriculture.

Consider how this plays out in the following fictional scenario. The same farm participates in the CoA in 1978, 2002, and 2017. Over these years, the farm has five operators: three men and two women. In 1978, the single operator they choose to report is a man. By 2002, when they can report three out of five operators, they choose to report two men and one woman. However, under the rules at that time only one qualifies as the "principal operator or senior partner." They designate a man again as the principal operator. Finally, in 2017 they can report four of their five producers/operators. They choose to report two men and two women. They can also designate up to four as the farm's principal operators; they designate all four. Thus, while the *actual* number and gender of farm operators did not change, the data indicates zero women operators in 1978, one nonprincipal woman operator in 2002, and two women principal operators in 2017. The results thus give the impression that the number of women farm operators and principal operators changed over time. Yet, only the CoA survey instrument changed. Even worse, if expanded to a national scale, the above example could easily suggest that the actual number of women farmers and ranchers in America had increased over the past forty years. Yet because of the survey's data-gathering limitations, there is no way to confirm whether or not this is the case.

Understanding Key Terms—"Producers"

Because of these liabilities, CoA users interested in compiling reliable information about the gender of operators must first understand how the census uses and defines the terms "primary producer" and "principal producer/operator" in 2017 before applying a similar sensibility to the terms used in previous censuses. The main problem is that the 2017 CoA blurs distinctions among the key terms it uses: it refers to "operator" and "producer" interchangeably and "principal producer" and "primary producer" are confusingly similar as well, leaving respondents unsure about the differences. The result is that respondents risk reporting their information inaccurately when they fill out the forms; subsequently, journalists and researchers often misinterpret the results.

Next, you need to understand the rationale that underlies the creation of each term. In the 2017 dataset, the USDA coined the term "primary producer" to denote a single main farmer on every farm, thus creating a variable comparable with "principal operator" from the 2012 CoA. However, unlike the 2012 "principal operator" variable, "primary producer" is NOT self-designated by the survey respondent, but rather calculated by USDA NASS after the data has already been collected. This is done using "principal operator(s)" status, the number of farm-related decisions each producer/operator is involved in, the number of days each producer/operator works off-farm, and a random designation if all the above are equivalent for two or more farmers (USDA 2017). How the USDA determines who is the "primary producer" for each farm or ranch is fairly complex (see Figure 1 for a flowchart).

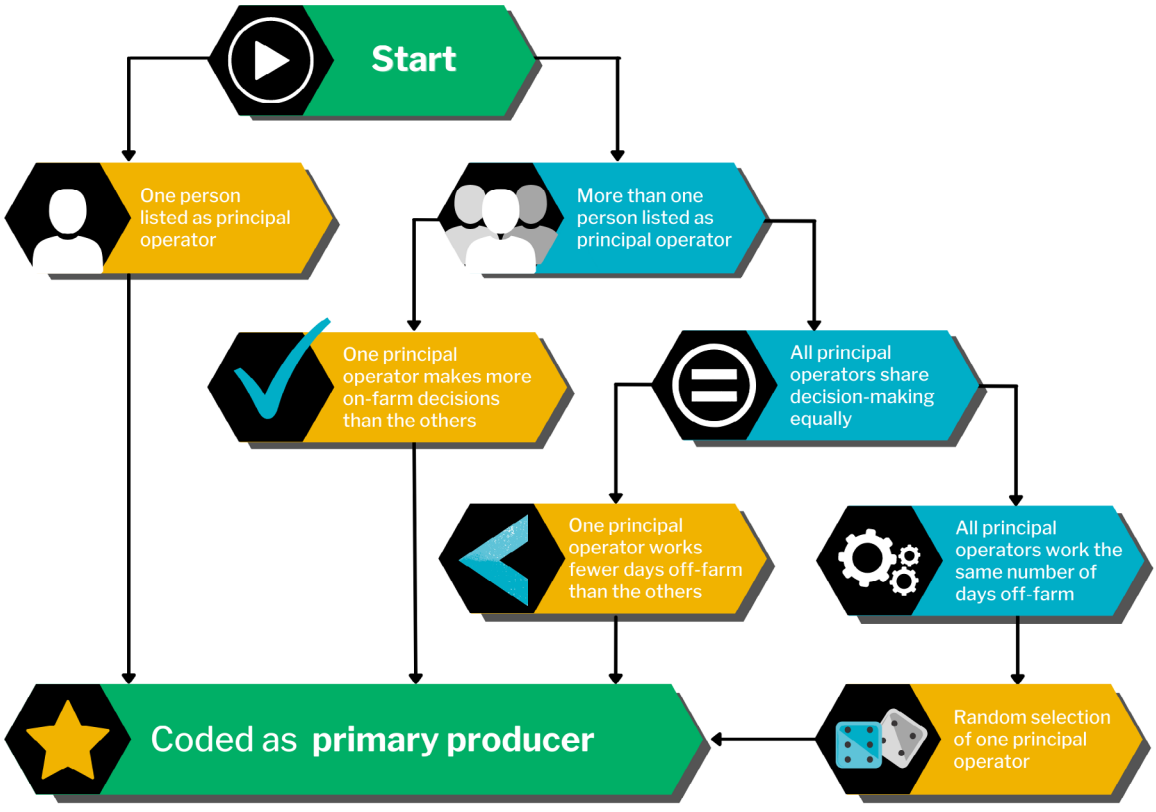
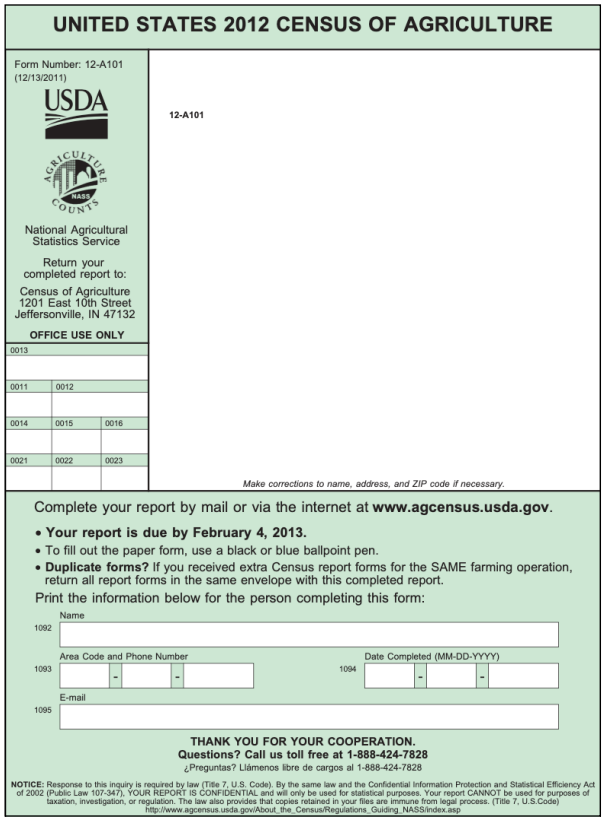


Figure 1. Visualization of USDA NASS Coding flowchart to create a "primary producer" variable from the 2017 Census of Agriculture.

One way to understand how misleading the results can be when working with data from the past forty years or so is to consider another scenario. Imagine a family farm run by a husband and wife, son, and daughter-in-law. In 1978, that farm would likely have been listed as having one male operator as the "principal operator." By 2012, that farm could list three "operators," likely the two men (dad and son) and a woman (wife), with the father listed as the "principal operator or senior partner" (Figure 2). By 2017, the farm could include all four people as "operators" and list any (or all of them) as "principal operators or senior partners" (Figure 3). Using information provided by the survey respondent, the USDA codes one of these principal operators (see Figure 1) as the "primary producer." In this scenario, perhaps the wife qualifies as the "primary producer" because she is listed as an "operator," a designated "principal operator" who works the fewest days off the farm.

Using Figure 1, we can walk through the above scenario to understand how we have arrived as the wife qualifying as the "primary producer." To start, there is more than one person listed as the principal operator, so we must consider each operator's decision-making authority to determine which operator is the primary producer. The survey respondent has indicated all principal operators share decision-making equally. Since one farmer does not make more on-farm decisions than the others, we must next look at the number of days each operator works off the farm. The wife works fewer days off the farm than the others and is therefore coded as the primary producer.

As in the first-mentioned scenario, the CoA's alteration of categories likely misleads users about the composition of a farming team. Indeed, a team may not have changed over the last four decades, but, due to changes in the CoA questionnaire form, the way respondents coded the farm did. So in 1978, a single man appears to be running the farm, but by 2017 women make up half of the farming team. This is not to say that either of these scenarios are correct or incorrect; rather, it highlights how the CoA changes have impacted census results, especially when compared across time. Educators and researchers alike therefore must use this understanding to contextualize data on women in agriculture so they can better serve their communities.



UNITED STATES 2012 CENSUS OF AGRICULTURE

Form Number: 12-A101
(12/13/2011)

USDA

National Agricultural Statistics Service

Return your completed report to:

Census of Agriculture
1201 East 10th Street
Jeffersonville, IN 47132

OFFICE USE ONLY

0013
0011 0012
0014 0015 0016
0021 0022 0023

12-A101

Make corrections to name, address, and ZIP code if necessary.

Complete your report by mail or via the internet at **www.agcensus.usda.gov**.

- **Your report is due by February 4, 2013.**
- To fill out the paper form, use a black or blue ballpoint pen.
- **Duplicate forms?** If you received extra Census report forms for the SAME farming operation, return all report forms in the same envelope with this completed report.

Print the information below for the person completing this form:

1092 Name

1093 Area Code and Phone Number

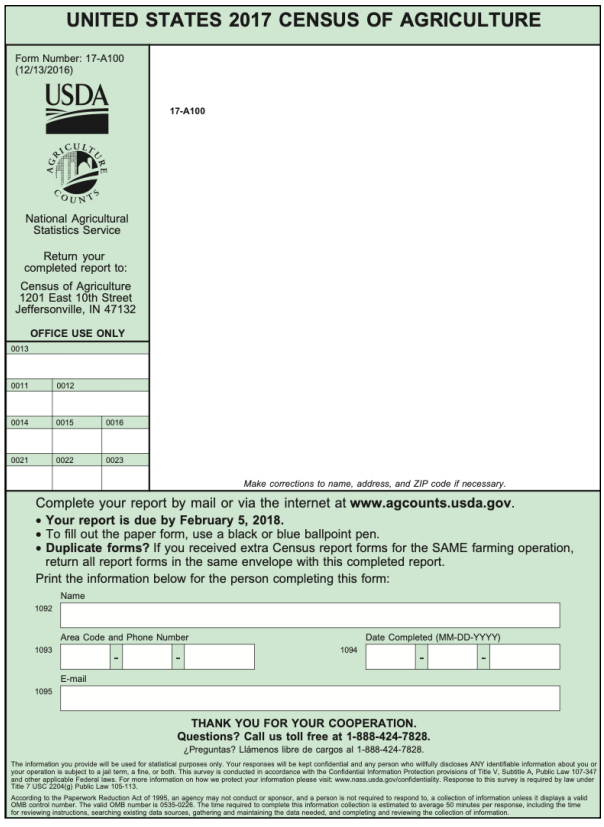
1094 Date Completed (MM-DD-YYYY)

1095 E-mail

THANK YOU FOR YOUR COOPERATION.
Questions? Call us toll free at 1-888-424-7828
¿Preguntas? Llámenos libre de cargos al 1-888-424-7828

NOTICE: Response to this inquiry is required by law (Title 7, U.S. Code). By the same law and the Confidential Information Protection and Statistical Efficiency Act of 2002 (Public Law 107-347), YOUR REPORT IS CONFIDENTIAL and will only be used for statistical purposes. Your report CANNOT be used for purposes of taxation, investigation, or regulation. The law also provides that copies retained in your files are immune from legal process. (Title 7, U.S.Code)
http://www.agcensus.usda.gov/About_the_Census/Regulations_Guiding_NASS/index.asp

Figure 2. The 2012 USDA Census of Agriculture operator characteristics report (questionnaire).



UNITED STATES 2017 CENSUS OF AGRICULTURE

Form Number: 17-A100
(12/13/2016)

USDA

National Agricultural Statistics Service

Return your completed report to:

Census of Agriculture
1201 East 10th Street
Jeffersonville, IN 47132

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0013
0011 0012
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17-A100

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According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a valid OMB control number. The valid OMB number is 0535-0226. The time required to complete this information collection is estimated to average 50 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Figure 3. The 2017 USDA Census of Agriculture operator characteristics report (questionnaire).

Table 1. Summary of the pros and cons of CoA data tools.

Tool	Description	Pros	Cons
Quick Stats Lite	This provides a specific, structured approach to commonly requested statistics.	Simplifies the variables to the most common four data sectors.	It only allows the user to access data organized by preselected data sectors. Years and geographic level of data vary greatly by sector.
Quick Stats	Subset of the CoA data—can only access certain popular variables; national, state, and county levels; means and counts.	Covers many years of the CoA; you can also get data from other non-Census USDA surveys; specific tabulations upon request.	Can be hard to find exactly what you want; interface not highly intuitive; interpretation of variables can be challenging.
Census Data Query Tool	Only available for CoA data starting in 2012; subset of the data—can only access certain popular variables; national, state, and county levels; means and counts.	More intuitive to use—simple and clear drop-down menus.	More limited than Quick Stats in the specific variables/stats it offers; interpretation of variables can be challenging.
Microdata	The raw data, including every farm's answer to every question in the CoA. Requires application and approval process with NASS; must be a US citizen to request data.	You can alter variables, create new variables, combine and compare variables, test complex hypotheses, and conduct statistical analyses.	You may only access the microdata via a data access station at one of the seven NASS Regional Offices located across the United States; data is in raw form; you must have knowledge of statistics and experience with an electronic statistics package.

Accessing the Census

Now that you understand how CoA data collection has changed and are more familiar with the key producer terms used on the CoA survey and in USDA NASS reports, let's examine how to access CoA data online and by request. USDA NASS produces a range of publicly available summary reports and videos on farms, land in farms, economics, operator demographics, and other useful information.[3] You can access CoA data through three searchable online databases:

1. USDA NASS Quick Stats Lite
2. USDA NASS Quick Stats
3. USDA NASS Census Data Query Tool

Quick Stats Lite provides a structured way to acquire commonly requested animal, crop, economic, and environmental statistics from the NASS CoA online database. **Quick Stats** (the full version) is the most comprehensive online data access tool; its searchable database allows users to customize their queries by location (state and county), commodity, or time period. Use the **Census Data Query Tool** to access and download CoA US/state and state/county level data; it has significant overlap with the Quick Stats tool (and a more user-friendly interface) but only offers 2012 and 2017 CoA data. The pros and cons for each of these data tools, along with the microdata, are summarized in Table 1. To access protected microdata, which is the raw form of all CoA questions, you must contact USDA NASS and complete an application process to receive clearance.

Since the Quick Stats Lite query tool is very limited, this publication focuses on accessing CoA data through Quick Stats, the Census Data Query Tool, and the protected microdata. For assistance accessing or interpreting CoA data, contact your regional or state NASS Field Office.[4]

Differences in State- and County-Level Data

Each of the three CoA databases—Quick Stats, the Data Query Tool, and the microdata—report information about farmers differently. As shown in Table 2, the numbers for all women farm producers/operators and women principal producers/operators match for each data-access option. However, the numbers for women primary producers/operators differ between the microdata and the Quick Stats Tool; the primary producers/operators information is not accessible at all using the Data Query Tool.

The difference in the microdata in Table 2 comes from a coding choice made by the authors of this publication. Instead of randomly designating an operator as the "primary producer" (as shown in Figure 1), in cases of a tie we designated the first-listed operator as primary. Because this person was more often than not a man, the estimated number of women primary farmers decreased. This is one advantage of relying on microdata—a research team can make its own choices about how to code and present the data.

Regarding county-level data (Table 3), neither the Quick Stats nor the Census Data Query tools can provide data on the number of women primary producers/operators at the county level. Estimates are only available using the microdata. There is also an inconsistency in the Quick Stats Tool, which reports a higher number of all women farm producers/operators in Latah County, Idaho, compared to the Data Query Tool and microdata.

Differences in Data by Specific Variables

Each data-access option reports figures for specific variables like production methods. If you use the Data Query Tool, you can find the number of organic farms in Idaho broken down into three categories: certified organic, exempt organic, and transitioning organic (Table 4). However, the farms cannot be differentiated by gender of the farm operator(s).

If you use the Quick Stats Tool, you can sort organic farmers by gender and note the number of women that farm organic land (although not the number of women *primary producers* that farm organic land). However, all the organic categories combine into a single category of "organic" that tallies the total number of certified or exempt organic farm producers/operators in 2017 at 195.

If using microdata, you can query every possible type of organic farming category—including certified, exempt, transitioning, and "other" (farms that follow organic practices without any formal recognition by the USDA). The relationship between women-operator types (farm operator, principal operator, and primary producer) and types of organic land (certified, exempt, transitioning organic, and other

Table 2. Counts of women farmers in Idaho by data source (USDA NASS 2017).

Online Tool	All Women Farm Producers/ Operators	Women Principal Producers/ Operators	Women Primary Producers/ Operators
Microdata	17,230	10,896	4,927
Quick Stats Tool	17,230	10,896	6,428
Census Data Query Tool	17,230	10,896	Unavailable

Table 3. Comparing counts of women farmers in Latah County, Idaho by data source (USDA NASS 2021).

Online Tool	All Women Farm Producers/ Operators	Women Principal Producers/ Operators	Women Primary Producers/ Operators
Microdata	801	551	262
Quick Stats Tool	817	551	Unavailable
Census Data Query Tool	801	551	Unavailable

Table 4. All organic farm producers/operators (men and women) in Idaho, per the Census Data Query Tool (USDA NASS 2017).

Organic Farms	Number of Farms
Certified Organic	261
Exempt Organic	34
Transitioning Organic	87

Table 5. Number of women primary producers in Idaho that farm organic land, per microdata (USDA NASS 2017).

Organic Farming Category	Women Primary Producers
Certified Organic	32
Exempt Organic	16
Transitioning Organic	14
Other (not USDA-recognized) Organic	38

[not USDA-recognized] organic) can be reviewed in any desired combination using the microdata—for example, women primary producers who farm organically, broken down by certified, exempt, transitioning, and "other" categories (Table 5).

The three different data-access options provide very different pictures of organic farming in Idaho. It is important to recognize these differences and understand the background of any data you use. Being clear about what you want to know is essential when determining the best database to use for accessing the CoA.

One of the best ways to do this is to reference actual questions on the CoA Questionnaire, identified by USDA as the CoA Report Form, by year. To access the most recent CoA Report Forms, visit https://www.nass.usda.gov/AgCensus/, find the "Latest Releases" section and click on the year in which you are interested. This will direct you to the Census Full Report page for that CoA year, where you will find the link to "Report Forms, Instructions, and Guide" at the very bottom of the page in the "Related Information" section. Click the hyperlink for that census year (in "Report Forms, Instructions, and Guide") and select the form in which you are interested from the list under the Report Forms section. Or, you can contact your regional or state USDA NASS Field Office for assistance. To find a regional or state Field Office, visit: https://www.nass.usda.gov/Statistics_by_State/RFO/index.php.

Conclusion

Understanding how CoA data on farmers has been collected over the past forty-five years or so is crucial for Extension educators, researchers, technical assistance providers, and others working in agriculture. It sharpens their use of the census when making funding decisions and improves their evaluation of various claims about women farmers by the media and some peer-reviewed publications. Ultimately, accurate accounting from available census data and interpretations of the data will lead to the beneficial allocation of resources to women farmers and ranchers and more solidly ensure the success of their agricultural operations.

Further Reading

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Notes

[1]CoA surveys use the term "operator" when asking questions about individuals involved in the day-to-day decisions of a farm or ranch.

[2]In 2017 the CoA used the term "operator" in survey questions and generally used the term"producer" when referring to operators in summary reports. For the sake of clarity as we discuss the 2017 CoA, we use the term "producer/operator."

[3]Find information on all your options,including tables generated by other researchers, at https://www.nass.usda.gov/Quick_Stats/.

[4]Find your regional and state NASS field office at https://www.nass.usda.gov/Statistics_by_State/RFO/index.php.

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