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Reductions in Reporting Errors in Total Acres Operated: Results from Multiphase Question Testing for the 2012 Census of Agriculture

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EXECUTIVE SUMMARY

The first two sections of the census of agriculture (COA) report form ask detailed questions about land ownership and usage. The first section, Acreage, collects information to determine the total acreage of the entire operation; the second section, Land, collects information to determine how the operation's acres were used during the census year. Historically, respondents have had many problems reporting the items in these two sections.

Four phases of testing were conducted during the 2007 COA and the 2012 COA to better understand misreporting problems and evaluate revisions to these two sections. The first phase analyzed imputation rates for individual items codes in these two sections for the 2007 COA. The second phase tried to identify the magnitude of misreported data items for the 2010 Census Content Test. The third phase analyzed error rates between the 2007 COA and the 2012 COA. The fourth phase consisted of telephone reinterviews with a subsample of respondents to the 2012 COA who misreported data in any or both of these two sections.

Comparisons of the number of reporting errors in Sections 1 and 2 show that the 2012 COA report form produced fewer errors than the 2007 report form. However, errors still remain and include respondents omitting their acres in farmstead and/or any other non-productive land (homes, buildings, woods, etc.) into their calculation of total acres operated. Errors also include misreporting of acres rented from others and/or inclusion of land rented out to others in the calculation of total acres.

For Section 2, Land, results from the error rate analysis indicate that multiple reporting of pasture items was significantly reduced in the COA from 2007 to 2012. The most common mistake was recording the acres for permanent pasture also under woodland pasture and/or other pasture (reporting the same pasture acres under different pasture categories).

Going forward, the 2012 COA report form version should be used as the basis for future versions of these two sections of the COA report form. Different wording and formatting versions for some of these questions could be developed and tested during the next content test in order to further improve these items. Also, continued effort should be made to improve reporting for different pasture categories.

RECOMMENDATIONS

1. Use the 2012 COA version of sections 1 and 2 as the basis for these sections for the 2017 COA report form.
2. Continue to develop and test different wording and format for these questions in order to further reduce errors, as part of the next content test.
3. Focus effort on improving reporting for the different pasture categories.
4. Continue to monitor the amount of misreporting for these questions to evaluate the effect of changes to these questions.

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Reductions in Reporting Errors in Total Acres Operated: Results from Multiphase Question Testing for the 2012 Census of Agriculture

Zulma T. Riberas, Jaki S. McCarthy, Stephen C. Logan, and HoaiNam N. Tran¹

Abstract

Multiple phase testing was conducted by the National Agricultural Statistics Service (NASS) for the 2012 Census of Agriculture (COA) to understand and address misreporting problems in the first two sections of the report form. The first section, Acreage, collects information to determine the total acreage of the entire operation; the second section, Land, collects information to determine how the operation's acres were used during the census year. The first phase of testing analyzed edit and imputation rates for individual report form items in these two sections for the previous (2007) COA. This led to revisions in the format, wording, and layout of the report form for field testing. The second phase examined a number of different types of errors in the 2010 Census Content Test. The third phase compared error rates between the 2007 and the 2012 COA to determine if the 2012 report form produced fewer reporting errors. The fourth phase consisted of telephone reinterviews with a subsample of respondents to the 2012 COA who misreported data in any or both of these two sections. The multiple rounds of testing and revisions to the Acreage and Land Sections of the 2012 report form did significantly lower the rate of errors in these sections.

Key Words: Reporting Errors, Imputation Rates, Error Rate Comparisons, Cognitive Follow-up Interviews

1. INTRODUCTION AND BACKGROUND

The census of agriculture (COA) report form includes two sections in which detailed questions are asked about land ownership and usage. Historically, respondents have had many problems reporting the items in these two sections. These questions are critical because they define the acres operated for the remainder of the form. Due to the ongoing importance and persistent editing needed in these report form sections, they have been revised several times in previous censuses.

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The National Agricultural Statistics Service (NASS) asked the Council on Food, Agricultural and Resource Economics (C-FARE) to assemble a panel of expert social scientists from academia, government, and the private sector to conduct an independent, comprehensive, and objective review of the COA. The findings and recommendations from this panel were published in *Improving Information about America's Farms and Ranches: A Review of the Census of Agriculture*. One of the panel's recommendations was that NASS should increase and broaden its research on item-level imputation. The C-FARE panel recommended analyzing the incidence of data imputation on the 2007 COA to improve the quality of the 2012 report form. They based their recommendation on the premise that a large number of imputations to a question imply that the question needs to be examined for improved wording or eliminated from the report form.

The first section of the COA report form, Section 1, Acreage, aims to determine the acreage of the entire operation by asking detailed questions about land owned (K43), land rented from others (K44), and land rented to others (K45). Respondents are asked to perform a simple mathematical calculation to determine the total number of acres operated (K46). The most common misreporting problems are: 1) providing the detailed data items (K43, K44, K45) and omitting the total (K46), and 2) the summation of the detailed data items not adding to the reported total.

The second section, Section 2, Land, aims to determine the number of acres by land usage during the census year. The land-use items are arranged in what is normally considered a decreasing order of economic importance. These items are: cropland harvested (K787), cropland on which all crops failed (K790), cropland in cultivated summer fallow (K791), cropland idle or used for cover crops (K1062), permanent pasture and rangeland (K796), woodland pasture (K794), cropland used for pasture (K788), woodland not pastured (K795), and all other land (K797). Each acre is to be reported only once in this section, even though the land may have been used for more than one purpose. Respondents are asked to add all these individual items to determine total acres (K798). The total acres figure should equal the total acres figure calculated in the previous section, Section 1, Acreage ($K798=K46$). A common misreporting problem is that the value reported in Section 1 for total acres (K46) does not equal the value reported in Section 2 for total acres (K798). Another common misreporting problem is that the summation of the detailed data items ($K787+K790+K791+K792+K1062+K796+K794+K788+K795+K797$) does not add up to the value reported for total acres (K798). (Note: K792 is Sugarcane and Pineapples Not Harvested, Hawaii report form only.) Throughout many censuses, these two sections have seen significant changes in the wording of the questions, and in the location and formatting of the sections.

This report focuses on four phases of testing that were conducted in preparation for the 2012 COA in order to increase our understanding of and reduce misreporting in these two sections. In addition, testing was used to examine the entire form and data collection procedures but is not included in this report. The first phase was a review of edit and imputation rates for individual items in these two sections for the 2007 COA. The second phase focused on identifying the magnitude of misreported data items for the 2010 Census Content Test. The third phase

compared the error rates between the 2007 and 2012 COA. The last phase consisted of a telephone reinterview study with a sample of respondents to the 2012 COA who misreported data in the first two sections of the report form. A series of scripted probes were asked with the goal of gaining information on why misreporting remains in these two sections.

2. METHODS

2.1 Phase 1: 2007 COA Item Edit and Imputation Rates Analysis

The edit and imputation rate analysis identified item codes with high edit and imputation rates for the 2007 COA. Item codes with edit and imputation rates of 30 percent or higher were identified for possible changes to question wording and/or report form formatting. The 30 percent imputation rate criterion was based on Guideline 3.2.10 from the *Standards and Guidelines for Statistical Surveys* developed by the Office of Management and Budget (OMB) to ensure consistency among and within statistical activities conducted across the Federal Government. This guideline suggests that if the item response rate is less than 70 percent, the agency should conduct an item nonresponse analysis to determine if the data are missing at random at the item level for at least the items in question. Data for this analysis were provided by the Census Planning Branch.

Edit changes were defined as a change in the value of an item from the original reported value. Imputation was defined as any automated change at a record level where a missing or zero value for an item code was replaced with a positive value. This included donor imputation, when a donor value from a different record was used to supply the missing value; and other computer generated changes from missing or zero to a positive value such as calculating a missing sum from other values provided on the report form.

Tables 1 and 2 show the edit and imputation rates for individual item codes for the first two sections of the 2007 COA report form. The headings for the tables represent the following:

Total Count: Total number of records with Current Data > 0

No changes: Reported Data = Current Data

Imputations: Reported Data ≤ 0, Current Data > 0

Automated Deletions: Reported Data > 0, Current Data ≤ 0

Edit Changes: Changes performed by the edit or an analyst such as corrections to positive values and deletions performed by analysts.

Table 1: Changes to Section 1, Acreage, 2007 COA

Key Code	Description	Total Count	No Changes (Percent)	Imputation (Percent)	Automated Deletions (Percent)	Edit Changes (Percent)	All Changes (Percent)
43	Land Owned	1,433,705	93.6	1.7	0.0	4.7	6.4
44	Land Rented from Others	517,870	94.7	1.3	0.5	3.5	5.3
45	Land Rented to Others	231,673	87.0	1.9	5.0	6.1	13.0
46	Total Acres	1,690,599	80.4	5.5	1.0	13.1	19.6

The items with the highest change rates were: K046 and K045.

No major imputation problems were found in Section 1, Acreage in 2007.

Table 2: Changes to Section 2, Land, 2007 COA

Key Code	Description	Total Count	No Changes (Percent)	Imputation (Percent)	Automated Deletions (Percent)	Edit Changes (Percent)	All Changes (Percent)
787	Cropland Harvested	1,019,301	63.1	11.8	3.7	21.4	36.9
790	Cropland Failed Crops	76,520	52.1	7.9	14.5	25.5	47.9
791	Cropland in Summer Fallow	66,029	40.6	11.7	19.9	27.8	59.4
1062	Cropland Idle	272,175	53.3	24.8	4.2	17.7	46.7
796	Permanent Pasture	813,586	62.5	7.5	4.4	25.6	37.5
794	Woodland Pastured	278,234	64.0	8.6	5.1	22.3	36.0
788	Cropland for Pasture	325,820	36.9	29.2	11.8	22.1	63.1
795	Woodland Not Pastured	450,580	64.2	8.8	4.4	22.6	35.8
797	All Other Land	825,236	68.5	10.9	3.8	16.8	31.5
798	Total Acres	1,523,825	72.0	17.5	0.0	10.5	28.0

The four items with the highest change rates were: K788, cropland for pasture; K791, cropland in summer fallow; K790, cropland on which all crops failed; and K1062, cropland idle or used for cover crops.

The items with the highest imputation rates were: K1062, cropland idle or used for cover crops; and K788, cropland for pasture.

In addition, there were 406,625 respondents (26.7 percent) who reported different values on the two total land items K46 and K798 (i.e., $K46 \neq K798$).

Results from the imputation rate analysis were used to identify the sections and questions that needed some changes. Changes to wording and format of selected sections or questions were incorporated into a draft for the 2010 COA Content Test. This draft form was cognitively tested multiple times with a small group of respondents as part of the redesign of the 2010 COA Contest Test report form.

2.2 Phase 2: 2010 Census of Agriculture Content Test

Census content tests are conducted prior to actual censuses of agriculture to evaluate and test a number of factors affecting the census program. They are conducted to evaluate factors affecting response and data quality including format and design of the instrument, new content items, changes to question wording, response burden, attitudes affecting response, selected procedural changes, and changes in respondent reporting which may lead to misclassification of a farm. Results of the content tests are analyzed to identify modifications to incorporate into the final design of the census of agriculture report form.

Significant wording and format changes were incorporated into Sections 1 and 2 of the 2010 COA Content Test report form (see Appendix A). Throughout the form, the wording of data items was reduced and bullets were used to highlight important information. For calculating total acres in Section 1, respondents were instructed to rewrite the individual values into specified response boxes prior to performing the calculation. In Section 2, changes were made to the wording for pasture items, and instructions were provided at the end of the page for respondents to verify that the total acres reported in Section 2 equaled the total acres reported in Section 1.

The 2010 COA Content Test included a national mailout of 30,000 report forms. This sample consisted of a nonrandom set of records to ensure that data would be reported in all sections of the report form; therefore, while the number of errors can be calculated, no direct comparisons to the full census mailing list can be made. After completion of the 2010 COA Contest Test, the data were reviewed to identify the magnitude of the problems in this sample. Table 3 shows the rate of several reporting errors.

Table 3: Errors in Sections 1 and 2, 2010 COA Content Test

Errors	Number	Percent
K43+K44-K45≠K46	1,829	16.3
K46 = missing	488	4.4
K798=missing	520	4.6
K787+K790+K791+K792+K1062+K796+K794+ K788+K795+K797≠K798	1,915	17.1
K46≠K798	1,370	12.2
Additional Potential Errors	Number	Percent
When: K787+K790+K791+K792+K1062+K796+ K794+788+K795+K797 >K798		
K796=K794	32	0.3
K796=K788	21	0.2
K794=K788	8	0.1

Analysis of the 2010 COA Content Test data indicated that out of 11,194 in-scope records (records that meet the census definition of a farm) 1,829 (16.3 percent) had total acres in Section 1 (K46) not equal to the sum of the parts (land owned and land rented from others minus the land rented to others). For Section 2, Land, 1,915 farms (17.1 percent) had total acres (K798) not equal to the sum of the parts (K787+K790+K791+K792+K1062+K796+K794+K788+K795+K797). Also, 1,370 farms (12.2 percent) had total acres in Section 1 (K46) not equal to total acres in Section 2 (K798).

Analysis of misreporting of pasture items indicated that multiple reporting of pasture items was reduced substantially. We looked at respondents who may have reported the same pasture acres in more than one of the listed pasture items. Thirty-two respondents (0.3 percent) reported the same number of acres for permanent pasture (K796) and woodland pastured (K794). Twenty one respondents (0.2 percent) reported the same number of acres for permanent pasture (K796) and other pasture (K788). Only eight respondents reported the same number of acres for woodland pastured (K794) and other pasture (K788).

Errors remained in the 2010 COA Content Test, but because of the sample necessary for this test, direct comparisons to error rates in the 2007 version of the report form cannot be made.

2.3 Phase 3: Error Rate Comparisons between the 2007 and the 2012 COA

The format and wording of Sections 1 and 2 were changed significantly from the 2007 COA to the 2012 COA. As in the 2010 COA Content Test, in Section 1, the wording of each item was reduced and bullets were used to highlight important information. In addition, response boxes were included for people to rewrite the individual pieces that go into the calculation of total acres prior to performing the calculation. Figures 1 and 2 below present the formatting and wording of Section 1 for the 2007 and the 2012 COA, respectively.

Figure 1: 2007 COA - Section 1, Acreage in 2007

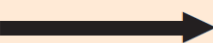
SECTION 1		ACREAGE IN 2007	
Report land owned, rented, or used by you, your spouse, or by the partnership, corporation, or organization named on the front of this form. Include ALL LAND, REGARDLESS OF LOCATION OR USE - cropland, Conservation Reserve Program (CRP) and Wetlands Reserve Program (WRP) land, pastureland, rangeland, woodland, idle land, farmsteads, etc.			
		None	Number of Acres
1. All land owned.	0043	<input type="checkbox"/>	
2. All land rented or leased from others , including land worked by you on shares, used rent free, in exchange for services, payment of taxes, etc. Include Federal, State, and railroad land leased on a per-acre basis. Exclude land (i.e. private, Federal, State, railroad, etc.) used on a per-head or animal unit month (AUM) basis under a grazing permit.	0044	<input type="checkbox"/>	
3. All land rented or leased to others , including land worked on shares by others and land subleased.	0045	<input type="checkbox"/>	
4. TOTAL ACRES in this operation for this census - Add items 1 and 2, then subtract item 3. If the entry is zero, please refer to the enclosed Instruction Sheet, section 1.			
These acres are referred to as THIS OPERATION for the remainder of this report.			0046
		None	Number of Acres
5. How many acres rented or leased to others (Item 3 above) did this operation own ?	0053	<input type="checkbox"/>	

Figure 2: 2012 COA – Section 1, Acreage in 2012

<div style="display: inline-block; background-color: black; color: white; padding: 2px 5px; font-weight: bold;">SECTION 1</div> <div style="display: inline-block; padding: 0 10px;">ACREAGE IN 2012</div>	
Report land owned, rented, or used by you, your spouse, or by the partnership, corporation, or organization named on the front of this form. Include ALL LAND, REGARDLESS OF LOCATION OR USE - cropland, Conservation Reserve Program (CRP) and Wetlands Reserve Program (WRP) land, pastureland, rangeland, woodland, idle land, farmsteads, etc.	
1. Number of acres owned 0043	<div style="text-align: right;">None</div> <div style="text-align: center;"> <input type="checkbox"/> </div> <div style="border: 1px solid black; background-color: #d9ead3; text-align: center; padding: 2px; font-weight: bold;">BOX A</div> <div style="border: 1px solid black; height: 20px; width: 100%;"></div>
2. Number of acres RENTED or LEASED FROM OTHERS 0044	<div style="text-align: center;"> <input type="checkbox"/> </div> <div style="border: 1px solid black; background-color: #d9ead3; text-align: center; padding: 2px; font-weight: bold;">BOX B</div> <div style="border: 1px solid black; height: 20px; width: 100%;"></div>
<div style="margin-bottom: 5px;"><u>INCLUDE</u></div> <ul style="list-style-type: none"> land worked by you on shares land used rent free in exchange for services, payment of taxes, etc. Federal, State, and railroad land leased on a per acre basis land rented or leased by you for cash 	<div style="margin-bottom: 5px;"><u>EXCLUDE</u></div> <ul style="list-style-type: none"> land used on a per-head or animal unit month (AUM) basis.
3. Number of acres RENTED or LEASED TO OTHERS 0045	<div style="text-align: center;"> <input type="checkbox"/> </div> <div style="border: 1px solid black; background-color: #d9ead3; text-align: center; padding: 2px; font-weight: bold;">BOX C</div> <div style="border: 1px solid black; height: 20px; width: 100%;"></div>
<div style="margin-bottom: 5px;"><u>INCLUDE LAND</u></div> <ul style="list-style-type: none"> worked on shares by others subleased rented or leased to others for cash used rent free in exchange for services, payment of taxes, etc. 	<div style="margin-bottom: 5px;"><u>EXCLUDE acres enrolled in:</u></div> <ul style="list-style-type: none"> Conservation Reserve Program (CRP) Wetlands Reserve Program (WRP) Farmable Wetlands Program (FWP) Conservation Reserve Enhancement Program (CREP) or acres rented or leased to others part of the year
a. How many acres rented or leased to others (Box C above) did this operation own? 0053	<div style="text-align: right;">None</div> <div style="text-align: center;"> <input type="checkbox"/> </div> <div style="border: 1px solid black; background-color: #d9ead3; text-align: center; padding: 2px; font-weight: bold;">Number of Acres</div> <div style="border: 1px solid black; height: 20px; width: 100%;"></div>
4. Enter the figures from the boxes above to determine your total acres operated:	
<div style="border: 1px solid black; background-color: #d9ead3; text-align: center; padding: 2px; font-weight: bold;">BOX A</div> <div style="border: 1px solid black; height: 20px; width: 100%;"></div>	<div style="border: 1px solid black; background-color: #d9ead3; text-align: center; padding: 2px; font-weight: bold;">BOX B</div> <div style="border: 1px solid black; height: 20px; width: 100%;"></div>
<div style="border: 1px solid black; background-color: #d9ead3; text-align: center; padding: 2px; font-weight: bold;">BOX C</div> <div style="border: 1px solid black; height: 20px; width: 100%;"></div>	<div style="border: 1px solid black; background-color: #d9ead3; text-align: center; padding: 2px; font-weight: bold;">BOX D</div> <div style="border: 1px solid black; height: 20px; width: 100%;"></div>
<div style="display: flex; align-items: center; justify-content: center; gap: 10px;"> + - = </div>	0046

For Section 2, the wording for each item was reduced and bullets were used to highlight the important information. In addition, the font for the subcategories of type of land was increased in size and bolded to help show that these were mutually exclusive categories. Changes were made to the wording for pasture items (in particular, cropland pasture was changed to other pasture), and instructions were provided at the end of the section for respondents to verify that the total acres reported in Section 2 equaled the total acres reported in Section 1. Figures 3 and 4 below present the formatting and wording of Section 2 for the 2007 and the 2012 COA, respectively.

Figure 3: 2007 COA – Section 2, Land

SECTION 2		LAND	
Report how the acres reported in SECTION 1, item 4 were used in 2007. Include land in CRP, WRP, and other State and Federal programs. Exclude land rented to others. Report land only once, in the first item that applies. For example: Land that was both pastured and had a crop harvested should be reported only in cropland harvested (item 1a).			
1. Cropland - Exclude cropland pasture.			
a. Cropland harvested - Include all land from which crops were harvested or hay was cut, all land in orchards, citrus groves, vineyards, berries, and nursery and greenhouse crops, Christmas trees, and short rotation woody crops.	0787	None <input type="checkbox"/>	Number of Acres
b. Cropland on which all crops failed or were abandoned - Exclude land in orchards and vineyards.	0790	<input type="checkbox"/>	
c. Cropland in cultivated summer fallow.	0791	<input type="checkbox"/>	
d. Cropland idle or used for cover crops or soil-improvement but not harvested and not pastured or grazed.	1062	<input type="checkbox"/>	
2. Pasture			
a. Permanent pasture and rangeland - Exclude cropland pasture.	0796	<input type="checkbox"/>	
b. Woodland pastured.	0794	<input type="checkbox"/>	
c. Cropland used only for pasture or grazing - Include rotation pasture and grazing land that could have been used for crops without additional improvements.	0788	<input type="checkbox"/>	
3. Woodland not pastured - Include woodlots, timber tracts, and sugarbush.	0795	<input type="checkbox"/>	
4. All other land - Include land in farmsteads, buildings, livestock facilities, ponds, roads, wasteland, etc.	0797	<input type="checkbox"/>	
5. TOTAL ACRES - Add the acres reported in items 1 through 4 above. Should be the same acres as those reported in SECTION 1, Item 4.	0798	<input type="checkbox"/>	

Figure 4: 2012 COA – Section 2, Land

SECTION 2		LAND	
<p>Of the acres reported in Box D on the previous page, report acres in the first item that applies. REPORT LAND ONLY ONCE ON THIS PAGE. NOTE: Report acres in CRP, WRP, FWP, and CREP in the most appropriate item below.</p>			
1. Cropland – Exclude cropland pasture.			
<p>a. Cropland harvested</p> <p><u>INCLUDE</u></p> <ul style="list-style-type: none"> land from which crops were harvested or hay was cut orchards and vineyards nursery and greenhouse crops 		<p><u>INCLUDE – cont.</u></p> <ul style="list-style-type: none"> Christmas trees citrus groves berries short rotation woody crops. 0787 	<p>None <input type="checkbox"/></p>
			Number of Acres
b. Cropland on which all crops failed or were abandoned – Exclude land in orchards and vineyards. 0790		<input type="checkbox"/>	
c. Cropland in cultivated summer fallow. 0791		<input type="checkbox"/>	
d. Cropland idle or used for cover crops or soil-improvement but not harvested and not pastured or grazed. 1062		<input type="checkbox"/>	
2. Pasture			
a. Permanent pasture and rangeland. 0796		<input type="checkbox"/>	
b. Woodland pastured. 0794		<input type="checkbox"/>	
c. Other pasture and grazing land (including rotational pasture) that could have been used for crops without additional improvements. 0788		<input type="checkbox"/>	
3. Woodland not pastured			
<p><u>INCLUDE</u></p> <ul style="list-style-type: none"> woodlots timber tracts sugarbush. 0795 		<input type="checkbox"/>	
4. All other land			
<p><u>INCLUDE</u></p> <ul style="list-style-type: none"> farmsteads, home, and buildings livestock facilities ponds roads wasteland, etc. 0797 		<input type="checkbox"/>	
			BOX E
5. TOTAL ACRES - Add items 1-4 to determine your total acres operated. 0798			
6. Does the total in Box E = the total in Box D on the previous page?			
<input type="checkbox"/> Yes - Continue			
<input type="checkbox"/> No - Go back and correct your figures. These numbers should be the same.			
<p>Acres in Box D (Box E) will be referred to as “this operation” for the remainder of this form.</p>			

Error rates were compared in reported data for items in Sections 1 and 2 for the 2007 and 2012 COA. Reported data were defined as the original data provided by the respondent before it went through edit and imputation programs. All in-scope records (Current Status Code = 61) for the 2007 and the 2012 COA were selected for analysis. There were 1,506,967 in-scope records for the 2007 COA and 1,366,194 in-scope records for the 2012 COA.

The first part of this analysis shows error rates for all data collection modes: mailout/mail-back, Computer Assisted Telephone Interview (CATI), Electronic Data Reporting (EDR), and Computer Assisted Personal Interview (CAPI). The second part of the analysis shows error rates for only mailout/mail-back report forms since CATI, EDR, and CAPI have basic edits built into their programs to minimize misreporting errors.

Section 1, Acreage:

Table 4 presents error rates for the most common misreporting problems in Section 1, Acreage for the 2007 and the 2012 COA for all data collection modes. The first line (Total Missing) on the table presents the results for the omission of Total Acres (K46=missing). The second line, total summation error, presents results for miscalculations in reporting total acres: $[K46 \neq (K43+K44-K45)]$. The third line presents the number of respondents that reported the information correctly. The fourth line presents the number of in-scope records for each census.

Table 4: Error Rates for Section 1, Acreage, for All Data Collection Modes

Type	2007 Census of Agriculture		2012 Census of Agriculture	
	Count	Percent	Count	Percent
Total Missing	80,664	5.4	57,965	4.2
Total Summation Error	114,657	7.6	103,687	7.6
Correct	1,311,646	87.0	1,204,542	88.2
Total	1,506,967	100.0	1,366,194	100.0

$$X^2 = (2, N=2,873,161) = 1934.20, p < 0.0001$$

As shown in Table 4, there was a small but significantly higher percent of correctly reported Total Acres in Section 1. The number of records with a missing value for K46 was reduced by 1.2 percentage points, and the number of correct records increased by 1.2 percentage points. Summation errors remained at 7.6 percent.

Further analysis of 2012 COA data indicate that of the records with summation errors, 41.7 percent reported having land rented or leased from others ($K44 > 0$), and 54.4 percent reported having land rented to others ($K45 > 0$). When looking at those who made no summation errors, 34.1 percent reported land rented or leased from others ($K44 > 0$), and 12.6 percent reported land rented to others ($K45 > 0$). Thus, rented land appears linked to these reporting errors.

Table 5 presents the error rates in Section 1, Acreage, for only mailout/mail-back report forms.

Table 5: Error Rates in Section 1, Acreage, for Mailout/Mail-Back Report Forms

Type	2007 Census of Agriculture		2012 Census of Agriculture	
	Count	Percent	Count	Percent
Total Missing	75,897	6.0	56,208	5.3
Total Summation Error	104,362	8.2	90,122	8.6
Correct	1,087,225	85.8	903,195	86.1
Total	1,267,484	100.0	1,049,525	100.0

$$X^2 = (2, N=2,317,009) = 493.28, p < 0.0001$$

For mailout/mail-back report forms, the number of records with K46 missing was reduced by 0.7 percentage points (7,347 records), and the number of correct records increased by 0.3 percentage points (3,149 records). The number of records with summation errors increased by 0.4 percentage points (4,199 records), compared to the 2007 COA.

Additional analysis of mailout/mail-back report forms for the 2012 COA indicate that of the records with summation errors 42.3 percent reported having land rented or leased from others (K44>0), and 54.9 percent reported having land rented to others (K45>0). For those with no summation errors, 33.5 percent reported land rented or leased from others (K44>0), and 13.0 percent reported land rented to others (K45>0).

Section 2, Land:

Table 6 presents error rates for the most common misreporting problems in Section 2, Land. The first line in the table presents the results for the omission of Total Acres (K798 = missing). The total summation error line presents results for miscalculations in reporting total acres in this section, [(K787+K790+K791+K792+K1062+K796+K794+K788+K795+K797) ≠ K798]. (Note: K792 is Sugarcane and Pineapples Not Harvested, Hawaii report form only.) The third line presents the number of respondents who correctly reported their information. The fourth line presents the total of in-scope records for each census.

Table 6: Error Rates in Section 2, Land, for All Data Collection Modes

Type	2007 Census of Agriculture		2012 Census of Agriculture	
	Count	Percent	Count	Percent
Total Missing	195,695	13.0	89,750	6.6
Total Summation Error	237,782	15.8	200,285	14.6
Correct	1,073,490	71.2	1,076,159	78.8
Total Record Count	1,506,967	100.0	1,366,194	100.0

$$X^2 = (2, N=2,873,161) = 35,723.65, p < 0.0001$$

Results from this table indicate that the number of correct records increased by 7.6 percentage points. The number of records with summation errors decreased by 1.2 percentage points, and the number of records with K798 missing was reduced by 6.4 percentage points.

Table 7 presents the results for error rates in Section 2, Land, for only mailout/mail-back report forms.

Table 7: Error Rates in Section 2, Land, for Mailout/Mail-Back Report Forms

Type	2007 Census of Agriculture		2012 Census of Agriculture	
	Count	Percent	Count	Percent
Total Missing	132,952	10.5	64,131	6.1
Total Summation Error	217,100	17.1	174,050	16.6
Correct	917,432	72.4	811,344	77.3
Total	1,267,484	100.0	1,049,525	100.0

$$X^2 = (2, N=2,317,009) = 14,909.16, p < 0.0001$$

Results from this table indicate that the number of correct records increased by 4.9 percentage points. The number of records with summation errors decreased by 0.5 percentage points, and the number of records with a missing value for K798 was reduced by 4.4 percentage points.

Further analysis of the 2007 COA and the 2012 COA data compared error rates for respondents who may have mistakenly reported their pasture acres in more than one of the listed pasture items. Table 8 presents the error rates for when the sum of the detailed item codes was greater than the reported total and the total was greater than zero: $[(K787+K790+K791+K792+K1062+K796+K794+K788+K795+K797)>K798 \text{ and } K798>0]$. (Note: K792 is Sugarcane and Pineapples Not Harvested, Hawaii report form only.) It also compares the error rates for potential multiple reporting of pasture items: (K796=K794, K796=K788, and/or K794=K788).

Table 8: Error Rates in Section 2, Land, for Potential Multiple Reporting of Pasture Items

Type	Case	2007 Census of Agriculture		2012 Census of Agriculture	
		Count	Percent	Count	Percent
Sum of Detail > K798	K796=K794	4,348	3.2	3,332	2.9
	K796=K788	36,435	26.5	2,253	1.9
	K794=K788	2,618	1.9	793	0.7
	Other	93,835	68.4	109,958	94.5
	Total	137,236	100.0	116,336	100.0

$$X^2 = (3, N=250,572) = 32,179.40, p < 0.0001$$

Results from this table indicate that the error rates for multiple reporting of pasture items were reduced from the 2007 COA to the 2012 COA, particularly for K796=K788 which decreased by 24.6 percentage points (28,619 records).

Table 9 presents the results for discrepancies between Total Acres reported in K46 and K798 (K46≠K798). The first line in the table presents results for the omission of Total Acres (K46 or K798 = missing). The total error line shows results for misreporting total acres between the two sections, (K46≠K798). The third line presents the number of respondents that correctly reported their information. The fourth line presents the total number of in-scope records for each census. The format of the census report form was redesigned for the 2012 COA. Instructions were added at the end of Section 2 asking respondents to verify that the two totals were equal.

Table 9: Error rates between Total Acres (K46) in Section 1 and Total Acres (K798) in Section 2 for All Data Collection Modes

Type	2007 Census of Agriculture		2012 Census of Agriculture	
	Count	Percent	Count	Percent
Either Total Missing	238,012	15.8	116,118	8.5
Total Error	219,991	14.6	95,412	7.0
Correct	1,048,964	69.6	1,154,664	84.5
Total	1,506,967	100.0	1,366,194	100.0

$$X^2 = (2, N=2,873,161) = 89,551.14, p < 0.0001$$

The number of records where the same number was reported for both total acres items was increased by 14.9 percentage points. The number of records with missing values for K46 and/or

K798 was reduced by 7.3 percentage points and the number of records edited was reduced by 7.6 percentage points.

Further analysis of 2012 COA data indicate that of 374,265 records with discrepancies in the summation of K46 and/or K798, 61.9 percent reported the same number for total acres in K46 and K798.

Table 10 presents the results for discrepancies between Total Acres reported in K46 and K798 (K46≠K798) for only mailout/mail-back report forms. The first line on the table presents the results for the omission of Total Acres (K46 or K798 = missing). The total error line presents results for misreporting total acres between the two sections, (K46≠K798). The third line presents the number of respondents that correctly reported their information. The fourth line shows the total number of in-scope records for each census.

Table 10: Error Rates between Total Acres (K46) in Section 1 and Total Acres (K798) in Section 2 for Mailout/Mail-Back Report Forms

Type	2007 Census of Agriculture		2012 Census of Agriculture	
	Count	Percent	Count	Percent
Either Total Missing	174,642	13.8	89,654	8.5
Total Error	197,949	15.6	77,034	7.4
Correct	894,893	70.6	882,837	84.1
Total	1,267,484	100.0	1,049,525	100.0

$$X^2 = (2, N=2,317,009) = 60,612.48, p < 0.0001$$

Results from this table show the rate of discrepancies in the two total acres figures on the paper report form was reduced by 8.2 percentage points. The number of records with missing values for K46 and/or K798 was reduced by 5.3 percentage points, and the number of correct records increased by 13.5 percentage points.

Additional analysis of 2012 COA data indicated that of 313,226 records with discrepancies in the summation of K46 and/or K798, 66.6 percent reported the same number for total acres in K46 and K798. This finding suggests that many respondents noticed the instructions asking them to verify that the two totals were equal.

Calls for assistance from the Incoming Telephone Call (ITC) toll free help number

In addition to the reductions in errors shown above, another indirect indication of the quality of the report form is the number of calls from respondents to the ITC toll free telephone help line. During each COA, a toll free telephone number is provided on the report form and other materials for use by respondents. The ITC is staffed with enumerators who provide help with any aspect of the census that respondents may request. For each call to the ITC a reason for the call is logged. In addition, for those calling for help in completing the report form, the section of the report form for which they requested help is also logged. Some respondents may have had problems with more than one section resulting in logging multiple sections. Comparisons of the number of calls requesting help completing the form showed a dramatic decline in the number of respondents requesting help completing the land section, as shown below. Of the calls for help, 23.8 percent were for help with the land section in 2007, compared to only 13.3 percent in 2012.

Table 11: ITC Requests for Help Completing the Report Form, 2007 COA and 2012 COA

	2007 Census of Agriculture		2012 Census of Agriculture	
	Count	Percent	Count	Percent
Total Calls	99,993	100.0	107,675	100.0
Land	23,780	23.8	14,340	13.3
Crops	4,927	4.9	2,920	2.7
Livestock	8,205	8.2	4,750	4.4
Production Contracts	543	0.5	437	0.4
Economic Data	7,299	7.3	3,498	3.2
Operator/Operation Characteristics	7,027	7.0	4,296	4.0
Address Label	1,265	1.3	1,754	1.6
Conclusion	4,025	4.0	2,254	2.1
EDR	679	0.7	4,778	4.4
Other	70,778	70.8	83,780	77.8

2.4 Phase 4: Cognitive Follow-up Interviews

Ideally, with the initial fielding of report forms with major changes, additional cognitive follow-up interviews to verify how the report forms were performing would be conducted. Follow-up interviews with respondents were not conducted after the 2010 Content Test and the format of the 2010 Content Test was incorporated into the 2012 Census of Agriculture report form. Follow-up interviews that focused on these two sections were conducted after the 2012 COA data collection to provide insight into whether respondents understood and reported their data correctly in these two sections.

These follow-up interviews were conducted over the telephone with a sample of respondents who misreported data in Sections 1 and/or 2 of the 2012 Census of Agriculture report form. This study consisted of 261 telephone follow-up interviews conducted by staff from NASS's National Operations Center (NOC). These interviews asked respondents to review their answers, provide more detail on what was included in their answers, and attempt to resolve any errors in their reports. The goal of this phase of the test was not to produce census estimates but to make a qualitative assessment of how respondents interpreted and responded to the census report form and to gain further insight into the sources of errors in data reporting.

The NOC conducted the follow-up interviews using a computer assisted telephone interview (CATI) instrument developed in BLAISE. BLAISE is a computer language used for creating computer assisted surveys. One week before the start of the telephone interviews, the Census Bureau's National Processing Center (NPC) mailed respondents a package which included a cover letter and copies of the first three pages of their completed 2012 Census of Agriculture report form. The cover letter informed respondents that they were going to be called by a NASS representative to discuss their answers. The cover letter is provided in appendix B.

Telephone enumerators at the NOC were trained to administer a series of structured probes in a scripted CATI reinterview regarding respondents' answers to questions in sections 1 and 2 of the census report form. Structured probes were less open-ended than the ones generally used in cognitive interviews and included questions like, *Do you own any land that was not included in item 1(K43)? Did you have any land used on a per-head or animal unit month (AUM) basis? Was this land included or excluded from your calculation of item number 2 (K44)?* These interviews lasted about 30 minutes. The interview questionnaire used to develop the CATI instrument is provided in appendix C.

A random sample was selected from completed 2012 Census of Agriculture records which met one or more of the following conditions:

$K043 + K044 - K045 \neq K046$

$K787 + K790 + K791 + K792 + K1062 + K796 + K794 + K788 + K795 + K797 \neq K798$

$K046 \neq K798$

$K796 = K794$

$K796 = K788$

K794 = K788

Valid telephone numbers

In addition a small number of operations with no obvious reporting errors were included in the sample.

There were 254 completed interviews in this study. Analysis of these interviews confirmed what we had already observed in previous censuses and content tests. The main problem in Section 1, Acreage in 2012, was that respondents did not report all their owned land in Section 1, K43, Number of Acres Owned. Out of 243 responses, 40 respondents (16.5 percent) indicated that they had not included all their land. Their most common mistake was forgetting to include acres in farmstead or other non-productive land (homes, buildings, woods, etc.) Other common misreporting issues were respondents forgetting to report acres rented from others and/or including in their total acres calculation the land that they rented out to others.

A major format change in this section was the use of response boxes for people to write down previously reported data items before calculating total acres operated. During the reinterviews, respondents were asked if they perceived the calculation of total acres to be a burden. Out of 235 respondents, only 29 respondents (12 percent) perceived the calculation of total acres to be a burden. However, these responses mainly indicated that acreages were generally difficult to report or had to be derived or obtained from records, not that they were burdened by the format of the question. Of those respondents, only 9 indicated they were confused by the format of the question.

For Section 2, Land, the major problem was the misreporting of pasture acres. Some respondents remained confused on how to report pasture. Their most common mistake was recording the acres reported for permanent pasture also under woodland pasture and/or other pasture (reporting the same acreage under different pasture categories). These respondents did not seem to understand the difference between the pasture categories and that they are mutually exclusive. This suggests that while reporting may have improved for pasture, it remained problematic.

Also, out of 66 respondents who reported different numbers for total acres in K46 and K798, 57 respondents indicated that they did not go back to correct their responses. Indicating the instructions to go back and correct their data were not effective for these respondents. Complete results from the cognitive follow-up interviews are provided in appendix D.

Overall, these interviews did not indicate any new types of reporting errors. Remaining errors seem to be similar to those considered in the form redesign.

3. DISCUSSION

The analysis for the Acreage and Land Sections of the COA report form included several individual studies: the analysis of imputation rates for individual data items for the 2007 COA, the analysis of reporting errors from the 2010 COA Content Test, the comparison of error rates between the 2007 and the 2012 COA, and the analysis of cognitive follow-up interviews with respondents to the 2012 COA. This multi-method approach provided several complimentary assessments to gain a better understanding of the misreporting issues associated with these two sections. Empirical comparisons of error rates show the magnitude of reporting error while more qualitative methods such as cognitive interviewing provide insight into the possible sources of error.

The analysis of the imputation rates for the 2007 COA data identified data items with high imputation rates and the questions that needed to be examined for improved wording. In an attempt to reduce reporting errors, the 2010 COA Content Test wording on the report form was reduced and bullets were used to highlight important information. In addition, response boxes were added for respondents to rewrite the individual values involved in the calculation of total acres prior to performing the calculation.

For Section 2, the highest imputation rates were for K1062, cropland idle or used for cover crops; and for K788, cropland used for pasture. For the 2010 COA Content Test, changes were made to the wording for pasture items, and instructions were provided at the end of the page for respondents to verify that the total acres reported in Section 2 equaled the total acres reported in Section 1.

The 2010 COA Content Test report form was the initial test of these changes. Analysis of the data indicated that out of 11,194 in-scope records, 16.3 percent of respondents had total acres in Section 1 not equal to the sum of the parts; and 12.2 percent had total acres in Section 1 not equal to total acres in Section 2. For Section 2, about 0.3 percent reported the same number of acres for both permanent pasture and woodland pastured; 0.2 percent reported the same number of acres for both permanent pasture and other pastures; and 0.1 percent reported the same number of acres for both woodland pastured and other pastures.

At the completion of the 2012 COA, error rates were compared in reported data for selected items codes in Sections 1 and 2 for the 2007 and the 2012 COA. In general, error rates were slightly reduced for all item codes in Sections 1 and 2. The largest error rate reduction was for discrepancies between total acres reported in Section 1 and total acres reported in Section 2 (K046≠K798). This error rate was reduced by 7.6 percentage points between the two censuses and it appears that the form redesign reduced reporting errors.

Wording and format changes were incorporated into the 2012 COA report form based on the results from the 2010 Census Content Test. Due to budget and time constraints follow-up interviews were never conducted after completion of the 2010 Census Content Test to verify that the changes were working as intended. After completion of the 2012 COA, a total of 261

follow-up interviews were conducted over the phone on a sample of respondents who misreported data in Sections 1 and/or 2; in addition, a small number of records with no obvious misreporting problems were also included in the sample. These interviews asked respondents to review their answers, and to attempt to resolve errors in their report. Analysis of these interviews identified similar errors of those observed in previous censuses for respondents reporting in error.

For Section 1, respondents forget to include acres in farmstead and/or any other non-productive land (homes, buildings, woods, etc.) in their calculation of total acres. They also forget to report acres rented from others and/or include the land that they rented out to others in their calculation of total acres.

For Section 2, the major problem was the misreporting of pasture items. The most common mistake was recording the acres for permanent pasture also under woodland pasture and/or other pasture (reporting the same acres under different pasture categories). Results from the error rate analysis indicate that multiple reporting of pasture items was substantially reduced from the 2007 COA to the 2012 COA, particularly for K796=K788 which decreased by 24.6 percentage points.

Overall, reporting errors were reduced with the revised 2012 COA report form, but the errors that remain are similar to those identified in the past.

4. RECOMMENDATIONS

1. Use the 2012 version of sections 1 and 2 as the basis for these sections for the 2017 COA report form.
2. Continue to develop and test different wording and format for these questions in order to further reduce errors, as part of the next content test.
3. Focus effort on improving reporting for the different pasture categories.
4. Continue to monitor the amount of misreporting for these questions to evaluate the effect of changes to these questions.

5. REFERENCES

Office of Management and Budget (2006). “Standards and Guidelines for Statistical Surveys.” Washington, DC.

www.whitehouse.gov/.../infoereg/statpolicy/standards_stat_surveys.pdf

The Council on Food, Agricultural and Resource Economics (C-FARE) (2007). “Improving Information About America’s Farms & Ranches: A Review of the Census of Agriculture.” Washington, DC.

http://www.cfare.org/UserFiles/file/publications/20070307cfare_census_review_Full_Report.pdf

APPENDIX A: Phase 2 - 2010 COA Content Test – Sections 1 and 2

SECTION 1 ACREAGE IN 2010											
<p>Report land owned, rented, or used by you, your spouse, or by the partnership, corporation, or organization named on the front of this form. Include ALL LAND, REGARDLESS OF LOCATION OR USE - cropland, Conservation Reserve Program (CRP) and Wetlands Reserve Program (WRP) land, pastureland, rangeland, woodland, idle land, farmsteads, etc.</p>											
						None	BOX A				
1. Number of acres owned..... 0043						<input type="checkbox"/>					
							BOX B				
2. Number of acres RENTED or LEASED FROM OTHERS 0044						<input type="checkbox"/>					
<u>INCLUDE</u> • land worked by you on shares • land used rent free in exchange for services, payment of taxes, etc. • Federal, State, and railroad land leased on a per acre basis • land rented or leased by you for cash			<u>EXCLUDE</u> • land used on a per-head or animal unit month (AUM) basis								
							BOX C				
3. Number of acres RENTED or LEASED TO OTHERS..... 0045						<input type="checkbox"/>					
<u>INCLUDE LAND</u> • worked on shares by others • subleased • rented or leased to others for cash • used rent free in exchange for services, payment of taxes, etc.			<u>EXCLUDE acres enrolled in:</u> • Conservation Reserve Program (CRP) • Wetlands Reserve Program (WRP) • Farmable Wetlands Program (FWP) • Conservation Reserve Enhancement Program (CREP)								
						Number of Acres					
a. How many acres rented or leased to others (Box C above) did this operation own?..... 0053											
4. Enter the figures from the boxes above to determine your total acres operated:											
BOX A		BOX B		BOX C		BOX D					
						0046					
5. Did this operation pay to use any land on a fee per-head or animal unit month (AUM) basis?											
<input type="checkbox"/> Yes - How many acres?..... 0041						<input type="checkbox"/> Don't Know		Number of Acres		DO NOT include these acres in the boxes above. If you did, GO BACK and EXCLUDE them from the boxes above and recalculate BOX D.	
<input type="checkbox"/> No - Continue											
6. Does the figure in Box D = 0?											
<input type="checkbox"/> Yes - Refer to the instruction sheet to complete this form						<input type="checkbox"/> No - Continue					
Location of agricultural activity for this operation											
a. In what county was the largest value of your agricultural products raised or produced?											
0055		Principal County Name				0060		State		0056	
b. If you also had agricultural activity in any other county, enter the county name(s), etc.											
3026		Other County Name(s)				3031		State		0057	
3027						3032				0058	
3028						3033				0059	
3029						3034				0042	

SECTION 2 LAND

Of the acres reported in **Box D**, report acres in the first item that applies. **REPORT LAND ONLY ONCE ON THIS PAGE.**
NOTE: Report acres in CRP in the most appropriate item below.

1. Cropland – Exclude cropland pasture.

a. Cropland harvested

INCLUDE

- land from which crops were harvested or hay was cut
- orchards and vineyards
- nursery and greenhouse crops

- Christmas trees
- citrus groves
- berries
- short rotation woody crops 0787

None

Number of Acres

☐

b. Cropland on which all crops failed or were abandoned –

Exclude land in orchards and vineyards 0790

☐

c. Cropland in cultivated summer fallow 0791

☐

d. Cropland idle or used for cover crops or soil-improvement but not harvested and not pastured or grazed 1062

☐

2. Pasture

a. Permanent pasture and rangeland – Exclude cropland pasture. 0796

☐

b. Woodland pastured 0794

☐

c. Other pasture and grazing land (including rotational pasture) that could have been used for crops without additional improvements 0788

☐

3. Woodland not pastured

INCLUDE

- woodlots
- timber tracts
- sugarbush 0795

☐

4. All other land

INCLUDE

- land in farmsteads and buildings
- livestock facilities
- ponds
- roads
- wasteland, etc. 0797

☐

BOX E

5. TOTAL ACRES - Add items 1-4 to determine your total acres operated 0798



Does the total in **Box E** = the total in **Box D**?

☐ **Yes** - Continue

☐ **No** - Please go back and correct your figures. These numbers should be the same.

Acres in **Box D** (**Box E**) will be referred to as “this operation” for the remainder of this form.

APPENDIX B: Phase 4 – Cognitive Interviews Cover Letter



July 5, 2013

Dear Farmer or Rancher:

The National Agricultural Statistics Service (NASS) is reviewing responses to the 2012 Census of Agriculture report form that you recently completed, and we need your help. We want to ensure farmers and ranchers understand the questions in a consistent way. This requires our researchers to contact a small group of people who returned their Census forms. We would like to review your responses to the Acreage and Land sections of your 2012 Census of Agriculture Census report form and ask you some additional questions. We are enclosing your responses to these two sections. You should receive a call from a NASS staff member to discuss your answers during the weeks of July 15 through July 26. The call should take no longer than 30 minutes.

All employees of NASS are required by Federal law to keep your answers **confidential**. Only sworn NASS employees with a need to know can see your report, and NASS will use your answers for statistical purposes only. The Census of Agriculture is required by law (Title 7, U. S. Code), but we are asking for your voluntary participation in this project to improve future censuses.

If you have any questions, please contact our primary researcher, Zulma Riberas via telephone: (703) 877-8000 Ext. 124 or email: Zulma.Riberas@nass.usda.gov or Nancy Dickey via telephone: (703) 877-8000 Ext. 161 or email: Nancy.Dickey@nass.usda.gov.

Thank you in advance for your cooperation in this important endeavor.

Sincerely,

A handwritten signature in black ink, appearing to read "Cynthia Clark".

Cynthia Clark
Administrator, National Agricultural Statistics Service
United States Department of Agriculture

Enclosure: Census Form

APPENDIX C: Phase 4 - Census Land Sections Telephone Follow-up Questionnaire

POID _____

Operator's Name _____

Telephone Number _____

Address _____

Hello, my name is _____, from the National Agricultural Statistics Service. We received your completed 2012 Census of Agriculture report form and we would like to go over some of your responses. This helps us ensure that everyone understands the questions as intended and that we are getting the most accurate data. Your form was randomly selected. About a week ago we mailed you a copy of the first three pages of your 2012 Census of Agriculture report form. Do you have that handy? We were wondering if we could review a few of the questions on the form with you and ask you some follow-up questions. This should only take about 30 minutes of your time. Do you have time now to answer a few questions?

090

¹ ☐ Yes Proceed with the interview

³ ☐ No Go to Question a

a. Can we call back at a later time?

091

¹ ☐ Yes Go to question b

³ ☐ No

b. When would it be a better time? ⁰⁹³ _____

Section 1 – Acreage in 2013

1. For item number 1, Number of Acres Owned (K43), you reported _____ acres. Can you tell me what you included on this land? What is this land used for?

¹⁰⁰ _____

2. Do you own any land which was not included in item 1 (K43)?

¹⁰²

- ¹ ☐ Yes Go to 2a
³ ☐ No Go to 3

2a. What is on that land? ¹⁰⁴ _____

3. You reported _____ acres in item number 2, Acres Rented or Leased from Others (K44). Did you include in these acres: all land worked by you on shares; all land used rent free in exchange for services, payment of taxes, etc.; all Federal, State, and railroad land leased on a per acre basis; and all land rented or leased by your for cash?

¹⁰⁶

- ¹ ☐ Yes Go to 4
³ ☐ No Go to 3a

3a. What was not included? ¹⁰⁸ _____

4. Did you have any land used on a per-head or animal unit month (AUM) basis?

¹¹⁰

- ¹ ☐ Yes Go to 4a
³ ☐ No Go to 5

4a. How many acres? ¹¹² _____

4b. Was this land included or excluded from your calculation of item number 2 (K44)?

¹¹⁴

- ¹ ☐ Included Go to 4c
³ ☐ Excluded Go to 5

4c. Why was it included? ¹¹⁶ _____

5. Did you read the list of includes and excludes in item 2 (K44)?

118

- ¹ ☐ Yes Go to 6
³ ☐ No Go to 5a

5a. Did you notice the list? ¹²⁰ _____

Include:

- Land worked by you on shares
- Land used rent free in exchange for services, payment of taxes, etc
- Federal, State, and railroad land leased on a per acre basis
- Land rented or leased by you for cash

Exclude:

- Land used on a per-head or animal unit month (AUM) basis

6. You reported _____ acres in item 3, land rented or leased to others (K45). Did you include in these acres: all land worked on shares by others; all land subleased; all land rented or leased to others for cash; and all land used rent free in exchange for services, payment of taxes, etc.?

122

- ¹ ☐ Yes Go to 7
³ ☐ No Go to 6a

6a. Why not? ¹²⁴ _____

7. Did you have any land in Conservation Reserve Program (CRP), Wetlands Reserve Program, land in Farmable Wetland Program (FWP), Conservation Reserve Enhancement Program (CREP), or any land rented or leased to others part of the year?

126

- ¹ ☐ Yes Go to 7a
³ ☐ No Skip to 8

7a Were these acres included or excluded from your calculation of item 3?

128

- ¹ ☐ Included Go to 7b
³ ☐ Excluded Go to 8

7b. Why were they included? ¹³⁰ _____

8. Did you read the list of includes and excludes in item 3 (K45)?

¹³²

¹ ☐ Yes

³ ☐ No Go to 8a

8a. Why not? ¹³⁴ _____

Include land:

-Worked on shares by others

-Subleased

-Rented or leased to others for cash

-Used rent free in exchange of services, payment of taxes, etc.

Exclude acres enrolled in:

-Conservation Reserve Program (CRP)

-Wetlands Reserve Program (WRP)

-Farmable Wetland Program (FWP)

-Conservation Reserve Enhancement Program (CREP)

-or acres rented or leased to others part of the year

9. You reported _____ in item 4 Box D (K46, Total Acres). How did you calculate this number?

¹³⁶

10. Did you perceive the calculation of Total Acres to be a burden?

¹³⁸

¹ ☐ Yes Go to 10a

³ ☐ No Go to 11

10aWhy? ¹⁴⁰ _____

11. Other comments and observations from this section:

¹⁴²

Section 2 – Land

1. For Section 2, Land, did you read the instruction at the top of the page?

¹⁴⁴

- ¹ ☐ Yes Go to 2
³ ☐ No Go to 1a

1a. Why not? ¹⁴⁶ _____

Instructions: Of the acres reported in **Box D** on the previous page, report acres in the first item that applies. **REPORT LAND ONLY ONCE OF THIS PAGE.** Note: Report acres in CRP, WRP, FWP, and CREP in the most appropriate item below.

2. Did you report acres in only one category?

¹⁴⁸

- ¹ ☐ Yes Go to 3
³ ☐ No Go to 2a

2a. Why not? ¹⁵⁰ _____

3. For item 1a, Cropland harvested (K787), you reported _____ acres. What did you include in these acres?

¹⁵²

4. Did you read the list of inclusions for cropland harvested (Item 1a, K787)?

¹⁵⁴

- ¹ ☐ Yes Go to 5
³ ☐ No Go to 4a

4a. Why not? ¹⁵⁶ _____

Include:

- Land from which crops were harvested or hay was cut
- Orchards and vineyards
- Nursery and greenhouse crops
- Christmas trees
- Citrus groves
- Berries
- Short rotation woody crops

5. For item 1b, Cropland on which all crops failed or were abandoned (K790), you reported_____ acres. What did you include in these acres?

157

5a. Did you exclude land in orchards and vineyards?

158

¹☐ Yes Go to 6

³☐ No Go to 5b

5b. Why not? ¹⁵⁹_____

6. For item 1c, Cropland in cultivated summer fallow (K791), you reported_____ acres. What did you include in these acres?

160

7. For item 1d, Cropland idle or used for cover crops or soil-improvement but not harvested and not pastured or grazed (K1062), you reported_____ acres. What did you include in these acres?

161

8. You reported _____ acres in item 2a, permanent pasture and rangeland (K796), what does the term “permanent pasture” mean to you?

162

8a.What did you include in this item?

163

9. You reported _____ acres in item 2b, woodland pastured (K794), what does the term “woodland pastured” mean to you?

164

9a. What did you include in this item?

165

10. You reported _____ acres in item 2c, other pasture and grazing land (K788), what does the term “other pasture” mean to you?

166

10a. What did you include in this item?

168

11. You reported _____ acres in item 3, Woodland not pastured (K795). What did you include in these acres?

169

12. Did you read the list of inclusions for Woodland not pastured (Item 3, K795)?

170

¹ ☐ Yes

³ ☐ No Go to 12a

12a. Why not? ¹⁷¹

Include:

-Woodlots

-Timber tracts

-Sugarbush

13. You reported _____ acres for item 4, all other land (K797). Did you include in these acres all land in farmstead, home and buildings, livestock facilities, ponds, roads, wasteland, etc.?

172

¹ ☐ Yes Go to 9

³ ☐ No Go to 13a

13a. Why not? ¹⁷³

Include:

-farmstead, home, and buildings

-livestock facilities

-ponds

-roads

-wasteland, etc.

14. Was anything else included in item 4 (All other land, K797)?

174

15. You reported _____ acres in item 5, Total Acres (K798). Tell me how did you calculate this number?

176

16. Was item 5 – Box E (Total Acres, K798) equal to item 4 – Box D (Total Acres, K46) in section 1?

178

¹ ☐ Yes Go to 17

³ ☐ No Go to 16a

16a. Why was it not equal? ¹⁸⁰

17. Did Box E initially equal Box D?

182

¹ ☐ Yes Go to 18

³ ☐ No Go to 17a

17a. Did you go back to correct your responses?

184

¹ ☐ Yes Go to 17b

³ ☐ No Go to 18

17 b. Explain what changes were made?

186

18. Other comments and observations:

188

Thank you for your cooperation.

APPENDIX D: Phase 4 - Results from Cognitive Follow-up

254 Completed Interviews

7 Refusals

Section 1 – Acreage in 2013

1. For item number 1, Number of Acres Owned (K43), you reported _____ acres. Can you tell me what you included on this land? What is this land used for?

100

Responses: 243

Missing: 11

All Acres Owned 200

Farmland 26

Pastureland 11

Other 6

2. Do you own any land which was not included in item 1 (K43)?

102

Yes = 40

No = 203

Missing = 11

2a. What is on that land? ¹⁰⁴ responses 40

Farmstead 11

Other land (not farm land) 8

Home/lot in town 5

Woodland 5

Buildings 3

Pastureland 2

Cropland 2

Leased/Rented out land 2

Conservation 1

Other farm 1

3. You reported _____ acres in item number 2, Acres Rented or Leased from Others (K44). Did you include in these acres: all land worked by you on shares; all land used rent free in exchange for services, payment of taxes, etc.; all Federal, State, and railroad land leased on a per acre basis; and all land rented or leased by your for cash?

106

Yes = 55

No = 2

Missing = 197

3a. What was not included? ¹⁰⁸ 2 responses

Reported in the wrong section 1

Pastureland rented out 1

4. Did you have any land used on a per-head or animal unit month (AUM) basis?

110

Yes = 1

No = 56

Missing = 197

4a. How many acres? ¹¹² 1 response

Only one respondent with AUM acres = 800

4b. Was this land included or excluded from your calculation of item number 2 (K44)?

114

Included = 1

Excluded = 0

4c. Why was it included? ¹¹⁶ 1 response

Elderly, he is planning on setting the land up this way and charge per head.

5. Did you read the list of includes and excludes in item 2 (K44)?

118

Yes = 45

No = 6

Missing = 204

5a. Did you notice the list? ¹²⁰ 6 responses

No = 6

Missing = 248

6. You reported _____ acres in item 3, land rented or leased to others (K45). Did you include in these acres: all land worked on shares by others; all land subleased; all land rented or leased to others for cash; and all land used rent free in exchange for services, payment of taxes, etc.?

122

Yes = 78

No = 4

Missing = 172

6a. Why not? ¹²⁴ 4 responses

Included acres enrolled in CRP Program

Made mistake this is CRP land (58 acres)

Incorrectly put 10 acres in, does not rent any acreage to others

Put in wrong section

7. Did you have any land in Conservation Reserve Program (CRP), Wetlands Reserve Program, land in Farmable Wetland Program (FWP), Conservation Reserve Enhancement Program (CREP), or any land rented or leased to others part of the year?

126

Yes = 29

No = 53

Missing = 172

7a Were these acres included or excluded from your calculation of item 3?

128

Included = 8

Excluded = 21

Missing = 225

7b. Why were they included? ¹³⁰

8 responses

CRP land

Don't remember seeing that they were supposed to be excluded

Don't remember. Didn't have information handy when completing form. Was out of state and just estimated figures.

Included everything

Little confusing, just an acre

Made mistake

That is what you asked for

They are rented or leased

8. Did you read the list of includes and excludes in item 3 (K45)?

¹³²

Yes = 76

No = 3

Missing = 175

8a. Why not? ¹³⁴

3 responses

Doesn't recall seeing the list

Didn't read the list

More helpful to complete this form during winter because so much in a hurry during the summer. No time to read through thoroughly.

9. You reported _____ in item 4 Box D (K46, Total Acres). How did you calculate this number?

¹³⁶

234 responses

20 missing

Correctly reported = 204

Incorrectly reported = 21

Don't know = 1

n/a = 8

10. Did you perceive the calculation of Total Acres to be a burden?

138

Yes = 29

No = 206

Missing = 19

10a. Why? ¹⁴⁰ 29 responses

Had to get printout for answers

Acres operated vs. tillable

Small should not have been required

Operators are busy during this time

Confusing

Confusing

Did not understand

Did not make sense

Harder because he is old

Had to look at records

Had to separate land first and then add/subtract to make estimates was accurate

Hard to judge an acre of land, estimation

Information was sold which caused pricing to fluctuate

Just a little

Kind of repeating itself, confusing

Kind of hard

Kind of a nuisance

Many questions for small number of acres

Not a big acreage, had to look it up

Not sure how to break out

Confusing

First information to complete since husband's death

The entire questionnaire is a burden

Too old and doesn't have time for all of this

Hard to measurement of fields

Confusing

Was less than careful in allotting, didn't think about building acreage.

11. Other comments and observations from this section:

142

Responses = 34

No comments = 201

Missing = 19

Unclear if should list what was owned by wife

Should have question on first page about whether operation is still in business. Should be a shorter survey for small farms
A waste of taxpayer's money
Might not be 160 exactly
Census form is overwhelming
Confused by terminology: "land worked on by others", owner vs. operator
Do not want to do the census
Questions need to be more direct and simpler questions
Had to refer to instruction sheet; didn't know how to add the totals together
Section was confusing for an old person
Questions hard to understand
Confusing to break down the acreage
Confusing
Easier questions
Nonsense
Confused
Pretty simple
Confused
Confused (did not subtract figure out)
Need clarification: his tenant gets the first cutting but then the operator goes back and cuts a few more times so should he report it as his operated land or should his neighbor report the land
Was OK
What as listed rented or leased to others, felt nothing covered the situation that they have
Respondent specified an estimate
Feels it is not necessary, we should already have the information
Seems kind of irrelevant to his size
Waste of time
Should ask if acres owned has changed since last reported to shorten form
Found questions confusing
Impressed that we are interested in a farm this small
Did not enjoy answering any of the sections of the questionnaire
Hard to all together when you don't know what all is separate
Need smaller sections
Include measurement of what an acres is, how many feet are in an acre
Simpler wording
Government asks too much information
Didn't understand the need to know some of this information
Make it simpler
Easy to figure it out

He didn't want to say anything because he has enough trouble with the government
All 258 acres are in Fondulac county

Section 2 – Land

1. For Section 2, Land, did you read the instruction at the top of the page?

Instructions: Of the acres reported in **Box D** on the previous page, report acres in the first item that applies. **REPORT LAND ONLY ONCE OF THIS PAGE.** Note: Report acres in CRP, WRP, FWP, and CREP in the most appropriate item below.

144

Yes = 204

No = 38

Missing = 12

1a. Why not? ¹⁴⁶ 38 responses

Didn't pay attention/notice = 17

Can't remember = 6

Didn't read = 2

Too small = 2

Assumed questions were for total acres owned

Frustrated by long complex form for small operations

Has cataracts

In a hurry

Just an oversight

Just went down the thing and read and entered the numbers

Need to emphasized a little better, rest of it self-explanatory, not much pertained to him

New to this form

Operator can't read, he had friend read it to him

Passed it by, noticed CRP and doesn't have any

Too fine

2. Did you report acres in only one category?

148

Yes = 229

No = 13

Missing = 12

2a. Why not? ¹⁵⁰ 13 responses

Didn't separate waterways that were hayed
Didn't think it applied
Didn't think needed to complete this section
Hard to separate out the fields, not measured
Has acres in homestead but the cattle roam everywhere
Just assumed one piece of property
Must have missed cropland section
New to form
Should be 20 just an oversight
Thinks 10 acres should be in woodlands, didn't think they were formal timber tracts
Thought it was reported in section 1 and section 2 didn't apply
Very confusing

3. For item 1a, Cropland harvested (K787), you reported_____ acres. What did you include in these acres?

¹⁵²

143 responses

111 missing

Cropland	68
Hay	49
Pasture	4
Rented/Leased Out Land	8
All Acres	3
Tillable Acres	6
Woodland	1
Christmas Trees	1
Costal Bermuda	1
Tobacco	1
Garden	1

4. Did you read the list of inclusions for cropland harvested (Item 1a, K787)?

¹⁵⁴

Yes = 130

No = 7

Missing = 117

4a. Why not? ¹⁵⁶

Responses = 7

Didn't need to 1

Didn't see it	3
Doesn't think so, just hay	1
Has cataracts	1
Too small	1

5. For item 1b, Cropland on which all crops failed or were abandoned (K790), you reported_____ acres. What did you include in these acres?

157

Responses = 19

Missing = 235

Included all tillable acres

Acreage that have to brush hog

Acres torn up by wild hogs

Acres which would have been planted but had to get prevented planting due to drought

Cropland, renters acres

Doesn't remember

Entire acreage

Everything failed or abandoned

Failed from freeze

Just wet acres and trees

Land he was clearing and let go barren to mulch

Mountainside

One of the hay sales; last year was a bad year

Pastureland – all dry land

Problem with some crops; overtook about 2.5 acres of the 10

Rest of hay fields that was unable to cut

Says he made a mistake, land did not fail

Some of the Christmas trees could not be sold

The whole property, harvested early spring rest failed

5a. Did you exclude land in orchards and vineyards?

158

Yes = 16

No = 2

Missing = 236

5b. Why not? ¹⁵⁹ 2 responses

Misunderstood section
No, because he harvested them

6. For item 1c, Cropland in cultivated summer fallow (K791), you reported_____ acres. What did you include in these acres?

¹⁶⁰ Responses = 20
Missing = 234

Included all cropland again
Acres being changed over from deteriorating field
Acres rented out
Acres that crops are on
Confused about the summer fallow and cultivated used together
Corn
Double entered
Entire acreage – misunderstood
Getting crop ready to be planted
Just the tillable land; right now it's just hay
Leased out land
Maybe pastureland – can't remember
Plowed land, cultivated land
Rented acres
Said in error
Didn't think they had this
Summer fallow
Took orchard out and went to summer fallow
Used to be farmed; going to start farming it this year again
Wheat

7. For item 1d, Cropland idle or used for cover crops or soil-improvement but not harvested and not pastured or grazed (K1062), you reported_____ acres. What did you include in these acres?

¹⁶¹ Responses = 46
Missing = 208

CRP 8
CREP 1
40 on mountain and 20 acres hay (drought – no hay)
All cropland

Entire acreage – misunderstood
 Everything else
 Exactly what's requested
 Fields that used to have tobacco
 Floods for waterfowl hunting
 Food plots put out for quail
 Grassland, lands he leaves idle every year
 Ground clear but not utilized
 House is on these two acres
 Idle land for soil improvement
 Just pasture
 Just the land, grows grass for horses and goats
 Just the woodland
 Land that is untellable land – steep hills, deer foodplots
 More fields that just grew up and cut and brush hogged it
 More of a hunting area
 Abandoned orchard
 Pasture but classified wetland in a state program can be used 10% of the time

8. You reported _____ acres in item 2a, permanent pasture and rangeland (K796), what does the term “permanent pasture” mean to you?

¹⁶² Responses = 191
 Missing = 63

Grass	31
Pasture	51
Land that can't be tilled	14
Land with animals on it	50
Fenced in	14
Grazing land	15
Other	16

8a. What did you include in this item? ¹⁶³ Responses = 188
 Missing = 66

Pasture	162
All land	3
Hay	7
CRP land	1
Woodland/trees	2
Other	13

9. You reported _____ acres in item 2b, woodland pastured (K794), what does the term “woodland pastured” mean to you?

¹⁶⁴ Responses = 113
Missing = 141

Grass and trees	= 68
Trees	= 24
Entered in error	= 6
Brush	= 1
Hay	= 1
Fenced in	= 3
Other	= 6
Same as permanent pasture	= 4

9a. What did you include in this item?

¹⁶⁵ Responses = 110
Missing = 144

Pasture and trees	= 61
All acres	= 8
Fenced in	= 3
Woodland	= 3
Timber	= 3
Don't know	= 2
Entered in error	= 8
Same as permanent pasture	= 8
Hay	= 1
Other	= 8
Acres in trees	= 4
Acres in cattle	= 1

10. You reported _____ acres in item 2c, other pasture and grazing land (K788), what does the term “other pasture” mean to you?

¹⁶⁶ Responses = 93
Missing = 161

Land with grass	=15
Same as permanent pasture	=14
Area for animals	=8
Hay	=8
Someplace else you pasture	=5

Entered in error	= 6
Combination of permanent pastures and wooded pasture	=4
Other	=3
Land for houses, barns, buildings	=3
Don't know	=3
Land that can be used for crops or pasture	=2
Land not used	=2
Non tillable land	=2
Rotating pasture	=2
Land without animals	=1
Gravel land	=1
Not woodland	=1
Cropland used for grazing after picking up crops	=1
Next property that you got	=1
Not develop	=1
Other areas like roadways	=1
Pasture rented or leased	=1
Pasture that does not include grass or trees or native	=1
Pasture not owned	=1
Should be 10 acres, belongs to river authorities	=1
Something not permanent or woodland	=1
Land that is not on permanent pastures	=1
Seeded back to grass	=1
What was left over	=1
Yard	=1

10a. What did you include in this item?

¹⁶⁸ Responses = 93

Missing = 161

Grassland	= 46
Permanent pasture	=8
Entered in error	=9
House and yard	=4
Other	=5
All land	=3
Hay	=4
Pond/lake	=2
Other	=2
Rented out	=2
Trees and pasture	=2
CRP acres	=1
Non farmable ground	=1
Wetland and non tillable land	=1

What was left over =1
Woods and roadways =1
Don't know =1

11. You reported _____ acres in item 3, Woodland not pastured (K795). What did you include in these acres?

¹⁶⁹ No Woodland not pasture reported.

12. Did you read the list of inclusions for Woodland not pastured (Item 3, K795)?

¹⁷⁰

Yes = 82
No = 5
Missing = 167

12a. Why not? ¹⁷¹ _____

Responses = 5

Didn't notice
Doesn't recall, does have sugarbush, small one, maybe 20 acres
Did not read, knew the answer
Don't remember seeing it
Has cataracts

13. You reported _____ acres for item 4, all other land (K797). Did you include in these acres all land in farmstead, home and buildings, livestock facilities, ponds, roads, wasteland, etc.?

¹⁷²

Yes = 158
No = 3
Missing = 93

13a. Why not? ¹⁷³ _____

Responses = 3

15 acres pasture has a barn on it, house is on less than an acre
6 acres is CREP land, didn't list buildings
Land from ditch in front of the house to road, if home etc where included, total acres wouldn't be correct.

14. Was anything else included in item 4 (All other land, K797)?

174

Responses = 27

Missing = 227

10 acres of wood

A little pastureland

Land around building sites

Compost, driveway

Cropland was included

CRP land is 26.5 acres

Equipment, yard

Garden spots and some pasture

Garden spots too

Has a lot of frontage

Hay fields

Included entire farm = 2

Land around the barns

Large garden

Manufactured home and the shed

Might have included hay by waterway

Old cemetery

Pine trees, house, wasteland

Roads and lanes

Shed, not in the pasture

Stream, not used for anything

The barn

There is a creek

Total acres owned

Yard, garden

15. You reported _____ acres in item 5, Total Acres (K798). Tell me how did you calculate this number?

176 Responses = 253

Missing = 1

Calculated figures = 164

All property = 19

All land owned = 24

Number of acres on deed = 6

All pasture = 6

Doesn't remember = 6
 Left blank = 4
 Omitted acres for home and buildings = 3
 Land rented/leased out = 3
 Estimated = 2
 Knew they were supposed to match = 2
 n/a = 2
 All hay land = 1
 Miscalculated = 1
 Cropland = 1
 Added rental land to owned instead of subtracting = 1
 Just the two land uses, tenant and nursery = 1
 Omitted acres idle = 1
 Forgot to add CRP land = 1
 House = 1
 Yard = 1
 Other = 3

16. Was item 5 – Box E (Total Acres, K798) equal to item 4 – Box D (Total Acres, K46) in section 1?

178

Yes = 185
 No = 68
 Missing = 1

16a. Why was it not equal? ¹⁸⁰ _____

Responses = 68
 Missing = 186

Omitted acres rented
 Box D was left blank = 5
 Omitted homestead acres = 5
 Added in nursery
 Added renters part
 Miscalculated = 11
 All acres owned
 145 acres were rented
 Reported only land worked on (operated) = 2
 Checked the wrong box
 Confused = 2
 Confused his dad's land and his land
 Only included land from house
 Did not add in #4 for all other land

Did not understand = 7
Did not complete = 3
Did not include land in buildings
Does not remember
Elderly
Did not include CRP acres
His mom owns land so he didn't fill in section 1
Included all acreage
Included rental property in Total Acres on page 2
Inverted number in Box E. Box D is correct.
Just an oversight
Boxes caused confusion
Missing an acre
Need clearer instructions
Not sure
Wrote total acres owned in #5 Box E = 2
Renters
Only counted permanent acres total acres
CRP reported as all other land

17. Did Box E initially equal Box D?

182

Yes = 182
No = 66
Missing = 6

17a. Did you go back to correct your responses?

184

Yes = 9
No = 57
Missing = 188

17 b. Explain what changes were made?

¹⁸⁶ Responses = 9

Acreage that was rented out and around the house
Added 5 acres for his farm
Can't remember what changed. Looks that permanent pasture changed to 39 and box e 3rd digit adjusted
Changed figures a few times had to speak with someone in ag office to correct by email
Changed from 0 to 160 acres
Changed woodland to not pastured
Corrected pasture acres to woodland pasture only

Had to recalculate wasteland
Operator does not remember

18. Other comments and observations:
¹⁸⁸ No responses to this question