



United States
Department of
Agriculture



National
Agricultural
Statistics
Service

Research and
Development Division
Washington DC 20250

RDD Research Report
Number RDD-08-08
September 2008

Categorizing Nonresponse in Phase III of the 2006 Agricultural Resource Management Survey in Washington State

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EXECUTIVE SUMMARY

The National Agricultural Statistics Service (NASS) surveys farmers and ranchers across the United States and Puerto Rico to estimate crops and livestock, assess production practices, and identify economic trends. The Agricultural Resource Management Survey (ARMS) collects data covering chemical use and production practices with a specific focus on the financial well being of agricultural operations. ARMS is composed of three phases. Phase I is conducted May through July and screens for potential inclusion for Phases II and III. Phase II is conducted October through December and collects data on cropping practices and chemical usage. Phase III occurs February through April of the following year and collects detailed economic information about the agricultural operation and the operator's household. ARMS data are used by farm organizations, commodity groups, agribusiness, Congress, state departments of agriculture, and the United States Department of Agriculture (USDA). The USDA uses ARMS data to evaluate the financial well being of farms and ranches and to objectively evaluate critical issues related to agriculture and the rural economies.

ARMS Phase III (ARMS III) is the only phase with response rates generally lower than 80 percent, and thus the potential for nonresponse bias for this phase is higher. To improve ARMS III response rates, NASS' Research and Development Division and NASS' Washington Field Office decided to conduct a trial study examining the reasons behind nonresponse in Washington.

The data collection methods used in ARMS III were a combination of personal interview and mail. Some operations received only a field visit, while other operations received a field visit only if the operator failed to return his / her questionnaire in the mail. Field enumerators asked sample operators who had declined to cooperate on the survey to explain why they refused to complete the ARMS III questionnaire. The reasons provided were recorded and classified using an updated listing of refusal reasons originally created in a previous NASS study, *Identifying and Classifying Reasons for Nonresponse on the 1991 Farm Costs and Returns Survey* (O'Connor, 1992). Field enumerators also recorded the reasons for identifying sample operations as inaccessible.

Table 1 below displays the primary reasons for nonresponse. The authors recommend that nonresponse research be expanded to additional surveys and states to determine if reasons for nonresponse are survey specific and / or state specific. This will also assist in targeting those areas of the data collection process that need improvement.

Table 1: Top Three Reasons for Nonresponse (Refusal & Inaccessible)

Reasons for Refusal	Reasons for Inaccessible
1. Would not take time / too busy.	1. Tried several times; could not reach anyone for an appointment. Just an extremely busy person.
2. Will do other surveys, but not financial surveys.	2. No respondent, as listed on the label, could be found.
3. Information too personal / none of your business.	3. Respondent postponed the interview beyond the end of the survey period.

RECOMMENDATIONS

1. Continue researching the reasons for nonresponse in Washington to identify and study any trends that are occurring.
2. Gradually expand nonresponse research to all surveys and states. This will improve NASS' understanding of survey specific, state, regional, and national trends.
3. Apply the lessons learned to future nonresponse studies. Specifically, implement the following:
 - a. Designate an office use box on the back page of the questionnaire for recording the nonresponse code.
 - b. Add an edit check that triggers a warning if the questionnaire is coded refusal, inaccessible or incomplete and is missing a nonresponse reason code.
4. As NASS' knowledge of nonresponse grows, improve current training scenarios to address the major reasons for refusals and inaccessible.

Addressing Nonresponse in Phase III of the Agricultural Resource Management Survey in Washington State

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Abstract

The National Agricultural Statistics Service (NASS) surveys farmers and ranchers in the fifty states and Puerto Rico in order to estimate crops and livestock, assess production practices, and identify economic trends. One of NASS' annual surveys is the Agricultural Resource Management Survey (ARMS). ARMS collects data on chemical usage, production practices, and the financials / economics of agricultural operations.

ARMS is composed of three phases. Of the three, Phase III is the only one with response rates generally lower than 80 percent, the Office of Management and Budget's (OMB) threshold for assessing the impact of nonresponse bias. The low response rate for this phase increases the probability of biased results.

To understand and thereby improve their ARMS III response rate, NASS' Washington Field Office and NASS' Research and Development Division, conducted a study assessing the reasons for nonresponse. The results of this study are summarized in this report.

Key Words: Nonresponse, Response Rate, Data Collection, Agriculture

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² Special thanks to NASS' Washington Field Office (especially Joe Parsons, Dave Losh and Matthew Pautler), Washington Field Enumerators, Rich Hopper of NASS' Survey Administration Branch, and Terry O'Connor of NASS' Research and Development Division for making this research possible.

1. INTRODUCTION

The mission of the United States Department of Agriculture's (USDA) National Agricultural Statistics Service (NASS) is to provide timely, accurate, and useful statistics on United States and Puerto Rico agriculture. NASS annually conducts hundreds of surveys to estimate crops and livestock, measure production practices, and identify economic trends.

The Agricultural Resource Management Survey (ARMS) is a voluntary, multi-purpose national survey conducted annually on targeted commodities that vary from year-to-year. ARMS collects economic information used for assessing the financial well-being of the United States' agricultural sector. ARMS is also the primary vehicle by which NASS obtains data on production practices and chemical use for these targeted commodities.

ARMS data are used by farm organizations, commodity groups, agribusiness, Congress, state departments of agriculture, and the USDA. The USDA uses ARMS data to objectively evaluate government policies and other critical issues related to agriculture and the rural economy.

The ARMS is composed of three phases. Phase I, conducted May through July, serves as a screener for the later two phases, ensuring that operations are in business and determining whether they are currently producing the targeted commodities. Phase II, conducted October through December, focuses on chemical usage and production practices for target commodities. Phase III, conducted February through April of the following year, assesses the financial condition of the farm sector. This phase

collects data on income, expenses, assets, debt, and operator characteristics.

1.1 Nonresponse Problem

Over time, the response rate for ARMS has been decreasing. Monetary incentives are now being employed to boost response rates. However, monetary incentives add significantly to the cost of data collection and are ultimately limited in terms of their effectiveness. Therefore, additional research into the reasons for nonresponse is needed.

In general, survey nonresponse negatively impacts the quality of the survey data and estimates, and increases survey costs. Nonresponse in ARMS III affects NASS' income / expense estimates, increases data collection time, and significantly complicates the data editing process. Nonresponse also introduces bias that can not easily be explained / identified. Therefore, this study focuses on understanding nonresponse to pinpoint those area(s) of the data collection process needing improvement.

In ARMS III, there are three types of nonresponse: refusals, inaccessible, and incompletes.

- 1.) Refusals are operators who were actually contacted for data collection but refused to respond.
- 2.) Inaccessibles are operators who were not available and thus were not contacted for data collection.
- 3.) Incompletes occur when the respondent is unable or unwilling

to answer all of the questions on the questionnaire.

1.2 Purpose

The goal of the study was to gain insight into the most common reasons for nonresponse occurring in Washington State for the 2006 ARMS III. Data collection occurred February through April of 2007.

1.3 Definitions

Additional terms used throughout the report are defined below:

Usable: Reports with complete data.

Out of Business: Operation was not operating during the survey reference period.

Office Hold: Questionnaire was held in the office and not enumerated.

Non-Farm: Operation failed to meet USDA's definition of a farm.

2. METHOD

In 2006, Washington State had 1,506 agricultural operations sampled for ARMS III. The operations were selected based on income, commodities, and acreage.

Washington utilized two different questionnaires for ARMS III. The Cost and Returns Report (CRR) is the field enumerated version and was used to collect data on 484 operations through personal interviews. The CRR sample received pre-

survey letters informing the operators that a field representative would be contacting them to schedule an interview. Nine CRR sampled operations were excluded from the study since they did not meet the definition of a farm or were held in the office for other reasons.

The Core Version is a mailed version of the field questionnaire, which was mailed to 1,022 operations. Each operator receiving this version also received a pre-survey letter stating the importance of their participation. Of the 1,022 operations, 914 received a monetary incentive [\$20 Automated Teller Machine (ATM) card]. Ninety-nine operations did not receive any incentive. These 99 operations were used as a control group in a separate study focusing on the effectiveness of incentives on response rate. Also, 9 Core sampled operations did not meet the definition of a farm or were held in the office for other reasons. These nine were excluded from this study.

2.1 Enumerator Training

Survey workshops are conducted annually to train field enumerators on ARMS III data collection procedures. The Washington field enumerators were provided with the following instructions on how to handle nonresponse:

For refusals, the field enumerators were instructed to ask and record the operator's reasoning for not participating in the survey.

In the case of an inaccessible, the field enumerators were asked to document why the operator could not be contacted.

For incompletes, the field enumerators were

to record why the operator did not answer specific questions.

In all three cases, field enumerators were instructed to review a supplemental handout listing various nonresponse reasons. Each reason had its own unique corresponding numerical code. The field enumerator would then record the appropriate code in the designated *Office Use Box* on the questionnaire. Appendix A contains a copy of the supplemental handout. If a reason did not have a corresponding nonresponse code, the staff in the WA FO would allocate a new code number for that nonresponse reason.

An additional 30 minutes was added to the overall field enumerator workshop on recording reasons for nonresponse. All 30 enumerators participated in this additional training.

2.2 Project Costs

Additional field enumerator training costs were not incurred since the additional

nonresponse training was absorbed into the general survey workshop. No additional burden fell on the field enumerators since documenting the reasons for the nonresponse is a requirement for all surveys.

3. RESULTS

The research study classified the reasons for nonresponse in 2006 ARMS III for Washington State.

3.1 Overall Response Rates

As shown in Table 2, Washington's 63.6 percent response rate falls below the Office of Management and Budget's (OMB) threshold level of 80 percent.

Twenty-seven percent of respondents refused to complete ARMS III and 4.7 percent were deemed inaccessible.

Table 2: Overall Response Counts and Rates

1,506 in Sample	Usable	Out of Business	Refusal	Inaccessible	Incomplete	Office Hold	Non-Farm
Frequency	957	42	414	71	4	11	7
Percent^{1/}	63.6	2.8	27.5	4.7	<0.3	0.7	<0.5

1/ Totals may be over / under 100% due to rounding.

Table 3 summarizes the number of questionnaires that were usable, out of business, refusal, inaccessible, office hold, and non-farm by questionnaire version.

($X^2=9.93$, $df = 3$, and $p\text{-value} < .05$). This is primarily due to a large percentage of the Core version recipients receiving a monetary incentive with the questionnaire.

A Chi-Square Test of Independence was conducted to compare the response rates of the Core and CRR samples. The test showed that the response rates are significantly different across the two groups

Table 4, summarizes response rates by percentages across questionnaire versions.

Table 3: Response Counts by Questionnaire Version (Number)

Questionnaire Version	Usable	Out of Business	Refusal	Inaccessible	Incomplete	Office Hold	Non-Farm & Out of Scope	Total
CRR	286	11	157	19	2	6	3	484
Core	671	31	257	52	2	5	4	1,022

$$X^2=9.93, df=3, p=0.02$$

1/ The Chi-square test excluded "Out of Business", "Office Hold", and "Non-Farm - Out of Scope" categories since these were not relevant to the study. Therefore, examining only "Usable", "Refusal", "Inaccessible", and "Incomplete" by questionnaire version (CRR and Core), the degree of freedom is calculated as (Number of response categories - 1) * (Questionnaire version - 1) = (4 - 1) * (2 - 1) = 3.

Table 4: Response Rates by Questionnaire Version (Percent)^{1/}

Questionnaire Version	Usable	Out of Business	Refusal	Inaccessible	Incomplete	Office Hold	Non-Farm & Out of Scope
CRR	59.1	2.3	32.4	3.9	0.4	1.2	0.6
Core	65.7	3.0	25.1	5.1	<0.2	<0.5	<0.4

1/ Totals may be over / under 100% due to rounding.

3.2 Reasons for Refusal

An operator can refuse the survey either by writing “refusal” on the mail questionnaire or by refusing to complete the questionnaire when contacted by the field enumerator. For all mailed refusals, Washington’s staff reviewed the questionnaire and assigned the most appropriate reason using the nonresponse coding handout. For field interview refusals, the field enumerator determined which nonresponse reason best

described the situation and coded it on the questionnaire.

The results are displayed in Table 5, located on the following page. The top three reasons for refusing were “*Would not take time / too busy.*”, “*Will do other surveys, but not financial surveys.*”, and “*Information too personal / none of your business.*”

Table 5: Reasons for Refusing to Participate in ARMS III (by descending frequency order)

Frequency	Percent	Reason for Refusal
85	22	Would not take the time / too busy.
45	11	Will do other surveys, but not financial surveys.
44	11	Information too personal / none of your business.
24	6	Refused, but no reason given.
23	6	Out of business now, will not answer for the previous year.
18	5	Family illness / death.
17	4	Contact attempted, but respondent refuses on all surveys, and refused on this one.
14	4	Respondent only does compulsory surveys.
14	4	“I do not like surveys / I do not do surveys.”
14	4	“This is not a farm.”
13	3	“My farm is too small to count / too small to be representative.”
12	3	“You contact me too often.”
11	3	The respondent feels that surveys and reports hurt the farmer more than help.
10	3	I did this survey before, but not again.
7	2	Feels the survey items are too complex – too much recollection is involved.
6	2	“I will have nothing to do with the Government.”
5	1	Quitting farming.
5	1	The respondent feels the operation’s records are inadequate to complete the interview.
4	1	Would not keep appointments.
4	1	Farm records are at the tax advisors / lawyers.
3	<1	The operator called the office after receiving the pre-survey letter, and asked not to be contacted further.
3	<1	Does not think the information is kept confidential.
3	<1	Does not want to report due to legal / financial problems.
2	<1	Does not want to talk about farming.
2	<1	Spouse / secretary / etc. will not let the enumerator see the operator.
1	<1	“I just did a different survey for your office.”
1	<1	Known refusal, no contact attempted.
1	<1	Violent / threatening refusal.
1	<1	I just did a survey for someone else.
1	<1	Would not answer the door even though they were home.
21	Not included in the percent breakdown.	Missing Data (No reason provided on the questionnaire.)
414	100	Total

In 1990 and 1991, reasons for refusals and inaccessibles were studied across multiple states in ARMS III, (O'Connor, 1991 and 1992). In those years, ARMS was called the Farm Costs and Returns Survey. Table 6 compares Washington's top five reasons and where these ranked in previous studies. The top three reasons are ranked similarly across studies. However, there is variation

in the ranking of the fourth and fifth reasons across the three studies. This may be attributed to examining only one state while past studies focused on multiple states. Additional research would need to be conducted to determine whether or not Washington's refusal reasons are state specific.

Table 6: Comparison Ranking of the Reasons for Refusal in Washington's 2006 ARMS III Study Versus Nonresponse Studies from 1991 and 1992

2006 Washington Ranking	1991 Study Ranking	1990 Study Ranking	Reason for Refusal
1	1	1	Would not take the time / too busy.
2	6	27	Will do other surveys, but not financial surveys.
3	3	3	Information too personal / none of your business.
4	2	2	Refused, but no reason given.
5	22	17	Out of business now, will not answer for the previous year.

3.3 Reasons for Inaccessibles

If the field enumerator failed to contact / reach the operator to conduct a CRR interview, then the questionnaire would be coded as inaccessible. If a Core questionnaire receives no response via mail and the enumerator was unable to contact the operator, then the questionnaire was

coded as inaccessible.

According to Table 7, the three main reasons for inaccessible were: 1.) *“Tried several times; could not reach anyone for an appointment.”*, 2.) *“No respondent, as listed on the label, could be found.”*, and 3.) *“Respondent postponed the interview beyond the end of the survey period.”*

Table 7: Reasons for Inaccessibles in ARMS III (by descending frequency order)

Number	Percent	Reasons for Inaccessible
28	40	Tried several times; could not reach anyone for an appointment. Just an extremely busy person.
17	24	No respondent, as listed on the label, could be found.
7	10	Respondent postponed the interview beyond the end of the survey period.
4	6	Illness / death in the family prevents the operator from responding.
3	4	Farm records are not available until after the survey period closes.
3	4	No operation, as listed on the label could be found.
3	4	The operator is away on an extended vacation.
2	3	Non-English speaking respondent, interpreter not available.
1	1	The operator is away on business.
1	1	Access to the address on the label was denied by a gate / guard / etc.
1	1	Inaccessible, but no reason given.
1	Not included in the percent.	Missing Data (No reason provided on the questionnaire.)
71	100	Total

As stated earlier, nonresponse studies for ARMS III have been conducted in the past. Table 8 shows Washington’s top three inaccessible reasons and their ranking compared to past studies.

The results of the Washington study differ somewhat from the 1991 study and

substantially from the 1990 study. In 1990, the top two reasons were “*The operator is away on extended vacation*” and “*Illness / death prevents the operator from responding.*” However, the earlier studies covered more states, which may account for these differences.

Table 8: Comparison Ranking of the Reasons for Inaccessibles in Washington’s 2006 ARMS III Study Versus Nonresponse Studies from 1991 and 1992

2006 Washington Ranking	1991 Study Ranking	1990 Study Ranking	Reasons for Inaccessible or Incomplete
1	3	1	Tried several times; could not reach anyone for an appointment. Just an extremely busy person.
2	5	9	No respondent, as listed on the label, could be found.
3	6	5	Respondent postponed the interview beyond the end of the survey period.

4. INCOMPLETES

Incompletes occur when the respondent is unable or unwilling to answer all of the

questions on the questionnaire. Field enumerators recorded four reports as incomplete. This is less than 0.3 percent of the total nonresponse.

Table 9: Incompletes

Number of Incompletes	Percent of Total Nonresponse
4	0.3

5. LIMITATIONS

Analyzing the data uncovered 33 operations incorrectly coded as refusal instead of inaccessible. Also, two operations were incorrectly coded as inaccessible instead of refusal. There were also 22 operations where the enumerators failed to record a nonresponse reason code.

6. RECOMMENDATIONS

The authors recommend expanding the research of nonresponse to additional states and surveys. This will assist in determining if particular reasons for nonresponse are survey specific, regional, or national.

Additionally, the authors recommend designating a cell on the questionnaire for recording the reason for nonresponse. This will standardize the process for future research. Also, the authors recommend adding an edit to the questionnaire editing process to check if there is a nonresponse reason code for those questionnaires coded as refusal or inaccessible.

7. CONCLUSION

Studying the reasons for nonresponse has provided the Washington Field Office with a starting point for addressing future data collection activities. As understanding of the underlying reasons for nonresponse grows, enumerator training scenarios on handling particular refusals and inaccessibles can be improved.

Finally, the Research and Development Division and the Washington Field Office, will continue working together to study

nonresponse and how best to increase response rates.

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Appendix A

(Reasons for Nonresponse Coding Handout)

Reasons for Refusals, Incompletes and Inaccessibles

Code	Reasons for Refusals
1	Known refusal, no contact attempted.
2	Contact attempted, but respondent refuses on all surveys, and refused on this one.
3	Refused, but no reason given.
4	Would not take the time / too busy.
5	Information too personal / none of your business.
6	The respondent feels that surveys and reports hurt the farmer more than help.
7	"I did this survey before, but not again."
8	"I just did a different survey for your office."
9	"I just did a survey for someone else."
10	"I will have nothing to do with the Government."
11	"I do not like surveys / I do not do surveys."
12	Respondent only does compulsory surveys.
13	Does not think the information is kept confidential.
14	Mentions a specific grievance with the SSO or NASS (other than confidentiality).
15	Mentions a specific grievance with the state cooperator.
16	"My farm is too small to count / too small to be representative
17	"You contact me too often."
18	The respondent feels the operation's records are inadequate to complete the interview.
19	Farm records are at the tax advisors / lawyers.
20	Family illness / death.
21	Would not keep appointments.
22	Spouse / secretary / etc. will not let the enumerator see the operator.
23	Wants to be paid for interview time and effort.
24	Violent / threatening refusals.
25	Does not want to talk about farming.
26	Does not want to report due to legal / financial problems.
27	Quitting farming.
28	Out of business now, will not answer for the previous year.
29	Figures for the previous year were not typical.
32	"This is not a farm."
34	Will do other surveys, but not financial surveys.
52	Questionnaire was not sent to the field to avoid jeopardizing cooperation on other surveys.
53	Would not answer the door even though they were home.
365	The operator called the office after receiving the pre-survey letter, and asked not to be contacted further.
366	Does not believe in statistics, so will not complete an interview.
400	Technical problems -- data stored electronically and are currently not accessible.
401	Never heard of NASS.
402	Feels the survey items are too complex -- too much recollection is involved.
403	Currently has or recently had disease problem with herd/crops.

Code	Reasons for Inaccessibles and Incompletes
75	No operation, as listed on the label, could be found.
76	No respondent, as listed on the label, could be found.
78	The address on the label is vacant / burned out / no structure exists.
79	The operator is away on an extended vacation.
80	The operator is away on a brief vacation.
81	The operator is away on business.
82	The address on the label is summer-seasonal housing.
83	Access to the address on the label was denied by a gate / guard / etc.
84	Illness / death in the family prevents the operator from responding.
85	Farm records are not available until after the survey period closes.
86	Respondent postponed the interview beyond the end of the survey period.
87	Enumerator workload prevented this operation from being contacted during the survey period.
92	Non-English speaking respondent; interpreter not available.
94	Inaccessible, but no reason given.
116	Tried several times; could not reach anyone for an appointment. Just an extremely busy person.
150	INCOMPLETE -- Respondent provided partial information, but would not or could not provide enough information to make the questionnaire complete.