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The Effectiveness of Automated Reminder Messages Used on the 2007 Census of Agriculture and on the National Animal Health Monitoring System 2011 Small Producer Study

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EXECUTIVE SUMMARY

This report researches the impact of utilizing automated telephone reminders to increase response rates of the 2007 Census of Agriculture and the National Animal Health Monitoring System (NAHMS) 2011 Small Producer Study.

The first study was comprised of three experiments and was conducted on the 2007 Census of Agriculture. The target population for the experiments consisted of records for which agricultural activity was unknown. These records are historically the toughest group to contact and obtain a completed report. The standard data collection process consisted of an initial mail out form, followed by a thank you/reminder postcard and, if necessary, a first and second follow-up mail out form.

For the first experiment, the control group received the standard data collection process. The treatment group received an automated telephone reminder after the first follow-up form in addition to the standard data collection method.

For the second experiment, the control group received the standard data collection process. The treatment group received an automated telephone reminder after the first follow-up form and an extra postcard reminder after the second follow-up form in addition to the standard data collection method.

For the third experiment, in addition to the standard data collection method, the control group received an automated telephone reminder after the first follow-up form. The treatment group received an automated telephone reminder after the first follow-up form and a postcard reminder after the second follow-up form, in addition to the standard data collection method.

The second study consisted of a sample of known agricultural operations from the NAHMS 2011 Small Producer Study. The NAHMS standard data collection process consisted of a pre-survey package, a mail out form, and, if necessary, a telephone follow-up. The control group for this study received the NAHMS standard data collection package. The two treatment groups received automated telephone reminders after the initial mail out but before the telephone follow up. These telephone reminder messages varied in their wording.

Results from these studies showed that using automated telephone reminders significantly increased response rates for the 2007 Census of Agriculture but only showed a slight increase in response rates for NAHMS. Mailing extra postcard reminders to operators who had already received the automated telephone reminders did not have a significant effect on the overall response rates.

RECOMMENDATIONS

1. Continue to use automated telephone reminders and conduct additional testing to determine the most effective use of reminder messages. This includes how to use automated reminders most effectively within standard NASS data collection procedures, trained or professional speakers, or a NASS data user to record the message. In addition, different content should also be tested; for example stressing that if respondents do not respond they will receive additional contacts.

2. Investigate additional uses of the automated telephone reminders for pre-survey notification messages.

3. Increase the number of call attempts to five when using automated telephone reminders.

The Effectiveness of Reminder Messages Used on the 2007 Census of Agriculture and National Animal Health Monitoring System 2011 Small Producer Study

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Abstract

The National Agricultural Statistics Service (NASS) researches the use of automated telephone reminder software to increase survey response rates. The first study consisted of three experiments conducted on a sample of the 2007 Census of Agriculture. The first experiment evaluated the effectiveness of using automated telephone reminders as an addition to the Census of Agriculture's standard data collection procedures. The second experiment tested whether sending a second postcard reminder to respondents who already received automated telephone and standard postcard reminders increased response rates. The third experiment identified whether sending extra postcard reminders to respondents who received automated telephone reminders increased response rates. The second study was conducted on the NAHMS 2011 Small Producer Study, tested whether using different automated telephone reminder messages improve response rates.

Overall, the use of automated telephone reminder software is a promising addition to the tools NASS can use to increase survey response rates. However, further examination is needed to determine the most efficient and effective use of this technology.

Key Words: automated message, follow-up reminder, postcard reminder, response rate.

I.   INTRODUCTION AND BACKGROUND

Postcards mailed as survey follow-up reminders have been used in the past to increase response rates and are a generally accepted best practice in survey data collection. Today, voice messages left with respondents via the telephone are also being used. Automated telephone reminder software can be used to schedule and call lists of phone numbers and leave messages, either with a person or an answering machine. This technology has been used for many types of telephone messages, such as medical appointment reminders, broadcasts by groups to their membership, and emergency notifications. Research in some of these situations has shown that these reminders are effective and are received positively by their recipients (Dini, Linkins, Sigafoos, 2000; Franzini, Rosenthal, Spears, Martin, Balderas, Brown, Milne, Drutz, Evans, Kozinetz, Oettgen and Hanson, 2000; Krishna, Balas, Boren and Maglaveras, 2002).

Overall, there is a limited amount of documentation on the use of automated telephone reminder messages in survey research; however, automated telephone reminders do appear to increase response rates. The U.S. Census Bureau found that response rates were higher for households who had been left a reminder message than for those which received either no reminder or a postcard reminder (Bouffard, Brady, Stapleton and Imel, 2003). A test by the National Science Foundation also showed that telephone reminder messages prompted slightly higher survey response rates (Fecso, Ferraiuolo, and Finamore, 2006). Earlier tests by the National Agricultural Statistics Service (NASS) Pennsylvania Field Office showed that groups receiving automated telephone reminders resulted in higher response rates compared to groups receiving a postcard or no reminders (McCarthy, 2007 and 2008).

Mailing postcards is relatively inexpensive (24.05 cents each). Automated telephone reminder software can be even cheaper depending on the size of the sample (7 cents per completed call). The greater the sample size and/or the number of times used make this technology a cost effective solution. Also, telephone message can be easily modified and are not affected by mail delays.

II.   RULES AND DEFINITIONS

1.   Rules of Using Automated Software

The automated telephone reminder software was programmed to begin at 8:00 a.m. and end at 9:00 p.m., calling up to three times for unanswered numbers. The software was set to hang-up after six rings or if it reached an automated answering machine with an outgoing message longer than 25 seconds (these were assumed to be problem numbers or message machines unable to take recordings).

2. Rules of Automated Number of Attempts

The call was considered complete if:
  a. The message was received by either a person or an answering machine.
  b. The call had a busy signal or any other outcome such as outgoing message too long, fax or modem, or any other telephone company message, or
  c. Up to three attempts were made to leave a message.

3. Definitions

Farm: NASS defines a farm as any agricultural operation with any combination of sales, potential sales, and government payments totaling at least $1,000.

Criteria Record: A record that has potential to be considered a farm by NASS' definition.

In Scope (IS): An operating arrangement on which there were or could be sales of at least $1,000 worth of crops, livestock, poultry, or other agricultural products during the year. This includes Conservation Reserve Program only operations that received government payments of at least $1,000.

Out of Scope (OS) include the following situations:
  a. An agricultural operation that is now out of business.
  b. An operation that was never involved in agriculture
  c. An agricultural operation having less than $1,000 in agricultural sales.

4. Chi Square Test of Homogeneity

The Chi Square test is a family of tests and is commonly used in statistical analyses to answer questions about association between categorical variables (Bolboaca, Jantschi, Sestra, Sestras, and Pamfil, 2011). The Chi Square Test of Homogeneity was used in the analyses throughout this paper, to determine whether frequency counts were identically distributed or proportions in each category were similar across all treatments.

Let r be the number of treatments (columns) and c the number of response categories (rows). The Chi Square degree of freedom was calculated by $(r-1)*(c-1)$. The null hypothesis states that the response rates in each category were similar across all groups. The alternative hypothesis states otherwise (i.e. there were at least two different response rates in one response category across all groups). Mathematically:

$$H_0: P_{i,j} = P_{i,k}$$
$$H_a: P_{i,j} \neq P_{i,k}, \text{ for every } j \neq k \text{ and } 1 \leq i \leq c; \ 1 \leq j, k \leq r$$

The null hypothesis was rejected if the p-value was less than an alpha of 0.05.

III. EXPERIMENTS

This report describes the methods used and the results of the four automated telephone reminder experiments conducted during the 2007 Census of Agriculture and the NAHMS 2011 Small Producer Study.

1. 2007 CENSUS OF AGRICULTURE EXPERIMENTS

The 2007 Census of Agriculture enumerated all known potential agricultural operations. The primary mode of data collection was a self-administered mail form, which collected information on crop and livestock inventory and production, land use, agricultural economics, and demographics of agricultural operators. The Census of Agriculture standard data collection process consisted of an initial mail out form. This was followed by a thank you/reminder postcard, and, if necessary, first and second follow-up mail out forms.

Response to the 2007 Census of Agriculture, unlike most NASS surveys, was mandatory and required by law. Report forms were mailed to known and questionable agricultural operations on the NASS' list frame. This listing was compiled from many sources, which contained a mix of agricultural and non-agricultural records. Some of these sources had minimal information, perhaps only a name and address or phone number. Such questionable records were first screened for agricultural activity before the Census of Agriculture by a separate survey, the Agricultural Identification Survey (AIS).

The target population for this study was operations who did not respond to the AIS prior to the census or who were added to the mail list too late to be included in the AIS from nine states (California, Colorado, Florida, Georgia, Illinois, Louisiana, Nebraska, South Dakota, and Washington). For both of these groups, their agricultural activity was unknown. In addition, historical response rates for this particular group have been substantially lower than other groups.

This target population was chosen for additional reminders (automated telephone or extra postcard reminders, or both) since it was hypothesized that many of them might have thought that the form did not apply to them and therefore did not realize they had to return it. Only records having telephone numbers were chosen for automated telephone reminders. Both automated and extra postcard reminders stated that returning the form was required by law, even if they were not farming, and that failing to return the form would result in additional follow-up contacts.

The 2007 Census of Agriculture standard data collection process consisted of an initial mail out form. This was followed by a thank you/reminder postcard, and, if necessary, first and second follow-up mail out forms.

The first experiment was conducted on sampled records from Illinois, Louisiana, South Dakota, and Washington. In this study, the control group received the standard data

collection method. The treatment group received an automated telephone reminder after the first but before the second mailing of follow-up forms in addition to the standard data collection method.

The second experiment was conducted on sampled records from California and Georgia. The control group received the same standard data collection package as the control group in the first experiment. The treatment group received an automated telephone reminder after the first but before the second mailing of follow-up forms. The treatment group also received an extra postcard reminder after the second follow-up form in addition to the standard data collection method.

The third experiment was conducted on sampled records from Colorado, Florida, and Nebraska. The control group received the standard data collection package and an automated telephone reminder after the first but before the second mailing of follow-up forms. In addition to the standard data collection method, the treatment group also received an automated telephone reminder and an extra postcard reminder after the second mailing of follow-up form.

Since U.S. Postal Service standard mail was used to send out the forms, exactly how long it would take the forms to be delivered was indeterminable. Therefore, a delivery time of one to three weeks was estimated. To be sure the reminders were received **after** the forms, reminders did not begin until several weeks after the first mailing.

The National Processing Center in Jeffersonville, Indiana, conducted the automated telephone reminder calls. Reminders were scheduled to begin 5 days after a second mailing of the Census of Agriculture form. The messages were written with the most critical information first, so in the event of a recipient hanging up early, they would hear the purpose of the call. Due to the volume of calls, the maximum number of attempts was three. Also, records with invalid telephone numbers were excluded from the comparisons.

NASS' North Carolina Field Office mailed the extra postcard reminders to selected records two weeks after the third mailing of the report form.

1.1 Census of Agriculture - Experiment 1: Automated Telephone Reminders (Illinois, Louisiana, South Dakota, and Washington)

1.1.1 Method (Census of Agriculture - Experiment 1)

In experiment 1, records were selected from Illinois, Louisiana, South Dakota, and Washington for which agricultural activity was unknown. The control group received the standard data collection method. The treatment group received an automated telephone reminder after the first but before the second mailing of follow-up forms in addition to the standard data collection method (Appendix A). Table 1 summarizes the experiment.

5

Table 1: Automated Telephone Reminders

	Treatment Group: Automated Telephone Reminders	Control Group: No Reminder Call
Sample Size	18,462	2,063
Initial mail out form	Mailed on December 28, 2007	
Thank you/reminder postcard[1]	Mailed on January 14, 2008	
First follow-up form	Began February 11 and ended on February 28, 2008	
Automated telephone reminder[2]	Began February 16, 2008	None
Second follow-up form	Began March 24 and ended on March 28, 2008	

[1,2]Appendix A

1.1.2 Results (Census of Agriculture - Experiment 1)

Table 2 shows the outcome of the automated telephone reminder calls. Forty five percent of the treatment group was reached and listened to the entire message. The message was delivered to an answering machine 13 percent of the time. Approximately 25 percent of the cases did not receive the reminder message due to message calling rules (limit of three attempts). Thus, 58 percent of the calls were delivered to either a person or an answering machine.

Table 2: Automated Telephone Reminder Results

Outcome	Automated Telephone Reminder calls	
	Number	%
No answer (maximum attempt 3 calls)	**4,642**	**25.1**
Answered by a person	8,210	44.5
Answered by a machine	2,463	13.3
Hung up/Partial message left	59	0.3
Other[1]	3,088	16.7
Total number of cases[2]	18,462	99.9

[1] No connection, out-going message (OGM) too long, fax or modem, telephone company message, busy after voice.
[2] Percent Total may be greater or less than 100 percent due to rounding.

Table 3 displays the response rates by treatment group. The results showed that the completion rates were higher for the treatment groups for both in scope (1.2 percent) and out of scope (2.6 percent). The inaccessible rates were 3.7 percentage points lower for

the group that received automated telephone reminders compared to the group that did not receive the automated telephone reminders.

The Chi Square test results determined that frequency counts in each response code were not identically distributed across all groups. This signified that the group which received an automated telephone reminder had a significantly higher response rate than the group that did not receive a reminder call.

Table 3: Response by Treatment Group

Response Code	Treatment Group: Automated Telephone Reminders		Control Group: No Reminder Call	
	Number	%	Number	%
Contacted in follow-up	18,462		2,063	
IS Complete	1,659	9.0	160	7.8
OS Complete	5,454	29.5	555	26.9
Inaccessible	11,083	60.0	1,315	63.7
Refusal	266	1.5	33	1.6

$\chi^2 (3, N=20,525) = 12.1356, p=0.0069$

1.2 Census of Agriculture - Experiment 2: Automated Telephone and Extra Postcard Reminders (California and Georgia)

1.2.1 Method (Census of Agriculture - Experiment 2)

In experiment 2, records were selected from California and Georgia for which agricultural activity was unknown. This experiment studied whether sending a second postcard reminder to respondents who already received an automated reminder message and a standard postcard reminder helped to increase response rates. Specifically, the control group received the standard data collection package. The treatment group received an automated telephone reminder after the first but before the second mailing of follow-up forms. The treatment group also received an extra postcard reminder after the second follow-up form in addition to the standard data collection method (Appendix A). Table 4 summarizes the method used.

Table 4: Automated Telephone and Extra Postcard Reminders

	Treatment Group: Automated Telephone and Extra Postcard Reminders	Control Group: No Automated Telephone or Extra Postcard Reminders
Sample Size	25,951	2,862
Initial mail out form	Mailed on December 28, 2007	
Thank you/reminder postcard	Mailed on January 14, 2008	
First follow-up form	Began February 11 and ended on February 28, 2008	
Automated telephone reminder	Began February 16, 2008	None
Second follow-up form	Began March 24 and ended on March 28, 2008	
Extra postcard reminder[1]	Mailed between April 9th and 16th	None

[1] Thank you/reminder postcard was different from the extra postcard reminder (Appendix A).

1.2.2 Results (Census of Agriculture - Experiment 1)

Table 5 displays the outcome of automated telephone reminder calls. Fifty-five percent of the calls were delivered to either a person (44 percent) or an answering machine (11 percent). Thirty two percent of the cases did not receive the reminder message which may be due to limiting the number of attempts to three calls.

Table 5: Outcome of Automated Telephone Reminder Attempts

Outcome	Automated Telephone Reminder calls	
	Number	%
No answer (maximum attempt 3 calls)	**8,355**	**32.2**
Answered by a person	11,300	43.5
Answered by a machine	2,829	10.9
Hung up/Partial message left	87	0.3
Other[1]	3,380	13.0
Total number of cases[2]	25,951	99.9[2]

[1] No connection, OGM too long, fax or modem, telephone company message, and busy after voice.

[2] Percent Total number of cases may be greater or less than 100 percent due to rounding.

Table 6 displays the response by group. For in scope and out of scope categories, the completion rates of the treatment group were higher than the control group by 1.1 and 2.0 percentage points, respectively. The inaccessible rate was 2.6 percentage points lower for the group that received both automated telephone and extra postcard reminders, compared to the group that received the regular thank you/reminder postcard only.

The Chi Square test results showed that frequency counts in each response category code were not identically distributed across all groups. This signified that automated telephone and extra postcard reminders significantly increased response rates. However, the result did not show whether the automated telephone or extra postcard reminders helped to increase the response rate.

Table 6: Response by Treatment Group

	Treatment Group: Automated Telephone and Extra Postcard Reminders		Control Group: No Automated Telephone or Extra Postcard Reminders	
	Number	%	Number	%
Contacted in follow-up	25,951		2,862	
IS Complete	1,851	7.1	173	6.0
OS Complete	5,681	21.9	570	19.9
Inaccessible	18,112	69.8	2,073	72.4
Refusal	307	1.18	46	1.61

χ^2 (3, N=28,813) = 15.3280, p =0.0016.

1.3 Census of Agriculture - Experiment 3: Extra Postcard Reminder (Colorado, Florida, Nebraska)

1.3.1 Method (Census of Agriculture - Experiment 3)

In experiment 3, records were sampled from Colorado, Florida, and Nebraska for which agricultural activity was unknown. This experiment was to determine whether sending extra postcard reminders to respondents who received automated telephone reminders, helped to increase response rates. This experiment was similar to the second experiment except that the control group received an automated telephone reminder call. Table 7 summarizes the experiment.

Table 7: Extra Postcard Reminder Treatment

	Treatment Group: Automated telephone and Extra Postcard Reminders	Control Group: No Extra Postcard Reminder
Sample Size	11,525	1,305
Initial mail out form	Mailed on December 28, 2007	
Thank you/reminder postcard	Mailed on January 14, 2008	
First follow-up form	Began February 11 and ended on February 28, 2008	
Automated telephone reminder	Began February 16, 2008	
Second follow-up form	Began March 24 and ended on March 28, 2008	
Extra postcard reminder[1]	Mailed between April 9th and 16th	None

[1] Thank you/reminder postcard was different from the extra postcard reminder (Appendix A).

1.3.2 Results (Census of Agriculture - Experiment 3)

Table 8 displays the outcome of automated telephone reminder calls. Fifty-eight percent of the calls were delivered to either a person (43 percent) or an answering machine (15 percent). Also, 25 percent of the cases did not receive the automated reminder message, which may be due to the limited number of attempts.

Table 8: Outcome of Automated Telephone Reminder Attempts

Outcome	Automated Telephone reminder calls	
	Number	%
No answer (maximum attempt 3 calls)	**3,265**	**25.4**
Answered by a person	5,531	43.1
Answered by a machine	1,971	15.4
Hung up/Partial message left	31	0.2
Other[1]	2,032	15.8
Total number of cases[2]	12,830	99.9

[1] No connection, OGM too long, fax or modem, telephone company message, and busy after voice.

[2] Percent Total number of cases may be greater or less than 100 percent due to rounding.

Table 9 displays the response by group.   For in scope and out scope categories, the completion rates of the treatment group were slightly higher than the control group by 0.6 and 0.3 percentage points, respectively. The inaccessible rate was 0.6 percentage points lower for the group that received both automated telephone and extra postcard reminders (in addition to the standard data collection method), compared to the group that received the standard data collection method.

The Chi Square test results showed that distribution of counts in each response code were not significantly different across the two groups. In the other words, response rates were similar between the treatment and control groups. This suggested mailing an extra postcard reminder to respondents who received an automated telephone message reminder did not have a significant effect on response rates.

Table 9: Response by Treatment

	Treatment Group: Automated Telephone and Extra Postcard Reminders		Control Group: No Extra Postcard Reminder	
	Number	%	Number	%
Number contacted in follow-up	11,525		1,305	
IS Complete	993	8.6	105	8.0
OS Complete	3,259	28.3	365	28.0
Inaccessible	7,052	61. 2	807	61.8
Refusal	221	1.9	28	2.1

χ^2 (3, N=12,830) = 0.8796, p =0.8303

1.4   Discussion (Census of Agriculture - Experiments)

Both Experiments 1 and 2 showed that automated telephone reminders were effective in increasing response rates. In addition, their effectiveness might be enhanced if more messages are delivered. Future uses of automated reminders should consider increasing the messaging capacity or the rules for the number of call attempts. However, mailing extra postcard reminders to respondents who already received the automated telephone reminders did not have a significant effect on the overall response rates as shown in Experiment 3.

These experiments' samples consisted of records for which agricultural activity was unknown, and response rates for this particular group have been historically lower than those with known agriculture. Thus, even a fractional improvement in response rates is deemed beneficial.

2. NATIONAL ANIMAL HEALTH MONITORING SYSTEM 2011 SMALL PRODUCER STUDY

The NAHMS 2011 Small Producer Study (NAHMS) collects information on animal health, and food safety issues in 48 states. The Animal and Plant Health Inspection Service (APHIS), an agency of the Unites States Department of Agriculture, funds the survey and disseminates the findings.

The target population was livestock operations that meet the current USDA definition of small farms, having less than $250,000 value of sales. Also, included was a small portion of livestock operations between $250,000 and $500,000 value of sales to compare small farms against. Any in-business operation with a livestock farm type under $500,000 value of sales was eligible. The sample was stratified based on Commodity Groupings (Appendix C).

2.1 Method (NAHMS - Experiment)

NAHMS' standard data collection process consisted of a pre-survey package, an initial mail out form, and, if necessary, a telephone follow-up.

This experiment evaluated the effectiveness of different automated reminder messages. The control group received the standard data collection method. The two treatment groups received automated telephone reminders after the initial mail out but before the telephone follow up, in addition to the standard data collection method. Treatment group 1 received an automated telephone message that included the statement; "Reply via mail by April 11, 2011 to avoid a telephone follow up contact". Treatment group 2 received a regular reminder/thank you message (Appendix B).

Similar to the 2007 Census of Agriculture study, automated telephone reminder software was programmed to begin at 8:00 a.m. and end at 9:00 p.m., calling up to three times for unanswered numbers. Automated software was also set to hang-up after six rings, or if it reached an automated answering machine with an out-going message longer than 25 seconds (these are assumed to be problem numbers or answering machines that were not able to take recordings). Table 10 summarizes the experiment.

Table 10: Automated Telephone Reminder Treatment

	Treatment Group 1: Automated Telephone Reminder Message 1	Treatment Group 2: Automated Telephone Reminder Message 2	Group 3: Control – No Automated Telephone Reminder
Sample Size	7,000	7,000	2,000
Pre-survey Package	Mailed on March 14, 2011		
Initial mail out form	Began March 21 and ended April 8.		
Automated telephone Reminder	Began March 28		None
Telephone follow-up	Began April 11 and ended April 29		

2.2   Results (NAHMS - Experiment)

Respondents with invalid telephone numbers were excluded from all comparisons. Table 11 shows the results. A person was reached and listened to the entire message for slightly over 40 percent, for both groups. Approximately 70 percent of the calls were delivered to either a person or an answering machine. Around 10 percent of the cases did not receive the automated telephone reminder, which may be due to the limited number of call attempts.

Table 11: Outcome of Automated Telephone Reminder Attempts

Outcome	Automated Telephone Reminder Calls			
	Message 1 Group		Message 2 Group	
	Number	%	Number	%
No answer (maximum attempt 3 calls)	694	9.9	721	10.3
Answered by a person	2,874	41.1	2,869	40.1
Answered by a machine	1,943	27.8	1,935	27.6
Hung up/Partial message left	10	0.1	9	0.1
Telephone company message	472	6.7	446	6.4
Busy after Voice	85	1.2	92	1.3
No Call (not on called files).	852	12.2	855	12.2
Other	70	1.0	73	1.0
Total[1/]	7,000	100.0	7,000	99.0

[1/] Total Percent may not equal 100 percent due to rounding.

Table 12 displays the response by treatment group and shows that there were minimal variations in the response rates across the groups. The difference in completion rates between Messages 1 and 2 was only by 0.2 percentage points. The completion rates of the treatment groups using Messages 1 and 2 were 1.0 and 0.8 percentage points higher, respectively, than the control group.

The Chi Square test results showed that the differences in response rates between groups were not statistically significant. Thus, there was not enough evidence to conclude that the wording used in Message 1 or in Message 2 had an impact on response rates.

Table 12: Response by Treatment Group

Treatment	Group 1 Automated Telephone Reminder Message 1		Group 2 Automated Telephone Reminder Message 2		Group 3 No Automated Telephone Reminder	
	Number	%	Number	%	Number	%
Complete	4,176	59.7	4,166	59.5	1,173	58.7
Refusal	668	9.5	713	10.2	199	10.0
Inaccessible	1,346	19.2	1,305	18.6	405	20.3
Office Hold	810	11.6	816	11.7	223	11.2
Total[1/]	7,000	100.0	7,000	100.0	2,000	100.2

[1/] Total Percent in each group may not equal 100 percent due to rounding.

χ^2 (6, N=16,000) = 4.3074, p=0.6352

2.3 Discussion (NAHMS - Experiment)

Response rates for the groups which received automated reminders were higher than the group that did not, although in this case the difference was not statistically significant. There was also not a statistically significant difference between the messages that stated, "**REPLY via mail by April 11, 2011** to avoid a telephone follow up contact," the generic reminder message, and no reminder message. Testing on different or stronger worded messages that stress what kinds of follow-up contacts would happen if the form was not returned might produce different results. Also, using a trained or professional speaker or a NASS data user to record the message may also improve the effectiveness of this technology.

However, unlike the 2007 Census of Agriculture study, all of the non-responding NAHMS cases also received a subsequent computer assisted telephone interview (CATI). This may have diluted the measurable effectiveness of the automated telephone reminder message technology. Using automated telephone reminders earlier in the survey data collection process might increase the mail response so that additional data collection methods are not needed.

IV. COST ANALYSIS

The National Processing Center in Jeffersonville, Indiana was contracted to provide these automated reminder calls for both 2007 Census of Agriculture and NAHMS studies. The estimated cost per completed call was 7 cents. A completed call means that an automated reminder message was delivered to a person or an answering machine. There was no charge if a call could not be made due to no connection, out-going message too long, fax or modem, telephone company message, or busy. In contrast, the total cost for a postcard reminder was 24.05 cents (1.25 cents for printing and 22.8 cents for mailing). Therefore, using automated telephone reminders can be a cost effective strategy to increase response rates.

V. CONCLUSION

The overall results showed that automated telephone reminders help increase response rates in some situations. However, mailing extra postcard reminders to operations who already received automated telephone reminders did not affect the overall response rates, nor did adding reminders in advance of CATI telephone interview calls.

Additional research on the speaker and/or wording used in the automated telephone reminder messages could also be tested to obtain the most effective deployment of this technology.

Overall, the results showed that NASS should continue to use automated telephone reminders when applicable.

VI. RECOMMENDATIONS

1. Continue to use automated telephone reminders and conduct additional testing to determine the most effective use of reminder messages. This includes how to use automated reminders most effectively within standard NASS data collection procedures, trained or professional speakers, or a NASS data user to record the message. In addition, different content should also be tested; for example stressing that if respondents do not respond they will receive additional contacts.

2. Investigate additional uses of the automated telephone reminders for pre-survey notification messages.

3. Increase the number of call attempts to five when using automated telephone reminders.

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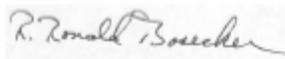**2007 Census of Agriculture - Postcard Reminder**

07-A01(L2)

THANK YOU . . . if you returned the 2007 Census of Agriculture report form you received earlier this month.

If you have not returned your report form, please take some time to complete and return it by **February 4, 2008**. Your prompt reply will provide valuable information that your community can use as it plans for the future and it gives U.S. agriculture a voice. Please be assured that your individual responses will be kept completely confidential, with all published information reported only in aggregate form.

If you have questions or need help, please call us at (888) 424-7828.

Sincerely,

R. RONALD BOSECKER
Administrator, National Agricultural Statistics Service
U.S. Department of Agriculture

2007 Census of Agriculture - Reminder Message

This is a courtesy call from the U.S. Department of Agriculture reminding you to return your 2007 Census of Agriculture form. Everyone who received a census form is required to respond. Even if you are not farming, please indicate this on the form. Either way, your prompt response will save us from having to contact you again. If you already responded, thank you. The information you provide is confidential and protected by law. If you have questions, please visit www.agcensus.usda.gov or call, toll free, 888-424-7828.

2007 Census of Agriculture - Extra Postcard Reminder

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Everyone who received a 2007 Census of Agriculture form is required by law to respond. If you have already done so, thank you. If not, please return your form right away as this will save us from having to contact you again.

Even if you are not actively farming, please indicate this when you respond so that we can remove you from our mailing list.

You may mail back your form or use our convenient, secure online response system at *www.agcensus.usda.gov.* (You will need the ID code printed on your Census mailing label.) Either way, the information you provide is confidential and protected by law.

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www.agcensus.usda.gov
(888) 424-7828

07-A00(1.5)

Appendix B

NAHMS - Reminder Messages 1 and 2

NAHMS - Reminder Message 1

Hello this is the United States Department of Agriculture's National Agricultural Statistics Service reminding you of the due date for returning your Livestock Operations report form. **REPLY via mail by April 11, 2011** to avoid a telephone follow up contact**.** THANK YOU if you already returned your report form. The study is designed to provide producers such as you with valuable information about the health, marketing, management, and biosecurity practices of small-scale livestock operations in the United States. If you have questions please call toll-free, 1-888-424-7828. Thank you for your cooperation.

NAHMS – Reminder Message 2

Hello this is the United States Department of Agriculture's National Agricultural Statistics Service reminding you of the due date for returning your Livestock Operations report form. **REPLY via mail by April 11, 2011**. THANK YOU if you already returned your report form. The study is designed to provide producers such as you with valuable information about the health, marketing, management, and biosecurity practices of small-scale livestock operations in the United States. If you have questions please call toll-free, 1-888-424-7828. Thank you for your cooperation.

Appendix C

Commodity Groupings

Commodity Groupings defined by NAHMS

Group 1	Control ID	Group 2	Control ID	Group 4	Control ID
corn all	320	tobacco	382	hogs	633
dry beans	330	cotton all	325	**Group 5**	**Control ID**
mustard seed	339	total vegetable cropland	50	milk cows	615
flax seed	340	total fruit/nut cropland	15	**Group 6**	**Control ID**
rapeseed	341	Flor VOS	909	cattle and calves all	610
sorghum	342	Nursery production ind	916	**Group 7**	**Control ID**
oats	352	Total Hort Sales	943	sheep all	640
rice	365	short rotation woody crops	941	goats max	644
rye	370	Christmas trees	942	**Group 8**	**Control ID**
safflower	371	potatoes	360	equine all	675
soybeans	372	sweet potatoes	380	**Group 9**	**Control ID**
canola	373	**Group 3**	**Control ID**	Layer & pullet	760
sunflowers all	378	hay all	345	Fighting Cocks	779
wheat all	390	haylage	344	Turkeys	770
dry peas	333	mint all	350	ducks	698
lentils	336	hops	353	broilers	765
millet	397	peanuts	354	emus	693
sunflowers	378	sugarbeets	374	**Group 10**	**Control ID**
triticale	389	sugar cane	376	aqua sales	679
barley	315	parsley	567	**Group 11**	**Control ID**
buckwheat	318	mushrooms	918	bees max	663
Popcorn	356	clover seed	923	mink	670
sum oilseeds		bluegrass seed	925	other livestock all	690
		fescue seed	933		
		ryegrass seed	934		
		timothy seed	935		
		grass seed	936		
		sod	938		
		alfalfa seed	921		