

A STUDY USING THE ASCS FARM SERIAL NUMBER AS THE SAMPLING
UNIT AND REPORTING UNIT FOR CROP AND LIVESTOCK SURVEYS

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Background

The ASCS list has been used as the sampling frame for a number of surveys. The sampling unit was the individual operator's name and the reporting unit was the total land operated. This approach has not been entirely satisfactory for probability surveys because there is considerable name duplication in the list. This causes difficulties in defining the reporting units properly since one farm operator may control several ASCS "farms". Removing or identifying even the obvious duplication is difficult and time consuming.

We have been seeking to develop satisfactory procedures for associating sampling units with reporting units using total land operated as the reporting unit and using the ASCS farm number as the sampling unit. The duplication that is not detected causes positive bias in the estimators. Therefore, a study to test the feasibility of using an ASCS "farm" as both sampling unit and reporting unit was conducted. Each farm number uniquely defines a particular parcel of land which may be all or a portion of a farming operation.

Objectives

The primary objective was to determine whether it is possible to collect crop and livestock data for the particular land area associated with each unique ASCS farm number. The study also tested the effect of sending an aerial photograph of the farm with the mailed questionnaire.

1/ This report presents findings from one portion of a comprehensive research project on multiple frame sampling. The project was undertaken jointly by the Research and Development Branch of the Standards and Research Division and the Tennessee and Oklahoma State Statistical Offices, all of the Statistical Reporting Service, U.S.D.A.

2/ R. Paul Moore is a Mathematical Statistician assigned to the Research and Development Branch, Standards and Research Division, SRS, U.S.D.A.

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Sampling Plan for Mail Survey

Maury and Rutherford counties in Middle Tennessee were chosen for the study since they contain large numbers of livestock. The ASCS office in Rutherford County distributes, to individual farm operators, a photocopy of an aerial photograph which shows the boundaries for each farm number. The Maury County office does not provide this service but maintains a folder for each farm which contains an aerial photograph of the farm with the boundaries marked.

Samples of 100 farm numbers in Maury County and 101 in Rutherford were selected. The ASCS list of farm numbers was the sampling frame. This list was up to date through August, 1968. The study was conducted in November and December, 1968. A few changes had occurred in the list between August and November, but no attempt was made to incorporate them into the list.

The eligible respondent for this survey was the actual current operator of the farm number selected.

In each county, 50 farm numbers were purposely selected because the operator appeared on the list more than once. Four operators in Maury and five in Rutherford were selected because they were enumerated for the June Enumerative Survey (thus, additional data on their operation was available). The remainder of the sample in each county was selected systematically beginning with a random number. No effort was made to exclude names on the list more than once, except those already selected.

A photocopy of an aerial photograph of the farm was mailed to about half of the sample in Rutherford county. About equal numbers of persons on the list more than once and those only on one time received the photocopy with the questionnaire. The questionnaires (See Exhibit I) were mailed on November 15, 1968 and reminder cards were sent on November 18 (See Exhibit II).

Response Rates from Mail Survey

The questionnaire asked for a response by November 25, 1968. The mailed return was far above the average for mailed surveys. A 63 percent response was obtained in Maury and 61 percent in Rutherford. The normal response rate for mailed surveys using the ASCS list is less than 30 percent. For example, the response rates for crop surveys conducted in 1968 in Tennessee were: March Acreage, 26.9%; June Acreage, 20.3%; and November Acreage and Production, 34%. A reminder card, mailed 3 days after the questionnaire, was used for the first time in the Tennessee November Acreage and Production Survey.

A number of factors were probably responsible for the excellent response. The various contributing factors listed below are opinions of the authors. No attempt was made to rank them according to importance.

1. The questionnaire was short and easy to understand.
2. A response by a specific date was requested.
3. The respondents may have concluded that this survey was an ASCS - SRS cooperative venture. ASCS had recently mailed a questionnaire to obtain social security numbers of all farm operators and owners.
4. The letter on the questionnaire was brief and to the point with a sentence that appealed to the conservative nature of many Tennessee farmers. The sentence referred to is; "Your report by mail will reduce survey costs by avoiding the necessity for a personal interview".
5. Reporting instructions were concise and easy to understand.
6. The questionnaire was personalized by writing the farm number of interest with a magic marker in a box at the top of the page.
7. The reminder card served as a reminder to report, a thank you note, and an opportunity to point out the research nature of this survey and the importance of each report.

There undoubtedly are other factors not listed which also influence the response rate. Isolation and analysis of some of the factors should be attempted in the future.

Table 1.--Number of questionnaires mailed and number returned by counties

Item	Total	Maury	Rutherford
	Number	Number	Number
Questionnaires mailed	201	100	101
Reports returned by mail	125	63	62
Non-respondents	76	37	39
Post Office unable to deliver (Included in non-response)	3	0	3

Reporting Accuracy for Mailed Survey

The questionnaires returned by mail were checked for completeness and reasonableness. If the reported land in farm differed from the ASCS acreage by 10 percent or more, the report was set aside for a follow-up interview. Also set aside were reports with unreasonable entries or blanks for any of the questions asked. Thirty-eight of the 125 questionnaires returned by mail were classified in one of these categories as needing additional information. These 38 respondents were interviewed to determine whether they had reported correctly or incorrectly by mail. The result was that 34 of the 38 had reported the various items questioned correctly. Two respondents had reported for another ASCS farm they operated, one respondent reported for his total farming operation and one respondent reported his cattle although they were not on the selected ASCS farm.

The 38 reports requiring follow-up interviews were questioned in the check procedures for various reasons. Two principal reasons why the reported data appeared unreasonable were: (1) respondents didn't know their total acreages accurately and (2) operations had changed since the list was obtained. Table 2 shows a tabulation of the reasons the reported data appeared questionable.

About one-third of the 87 mailed returns with no items questioned were interviewed to check their reporting accuracy. No errors were detected; that is, all of those interviewed had actually reported for the proper sampling unit.

The questionnaire included questions on crop acreages, livestock numbers and farm labor (See Exhibit I). The crop and livestock questions were answered accurately in nearly all cases. The follow-up interviews revealed that many respondents had responded incorrectly to the farm labor questions. Responses were equally poor regardless of whether the sampling unit was their total farming operation or only a portion of it. Many respondents didn't understand what kinds of activities should have been included as farm work. There was a definite tendency to under report the hours worked by the farm operator during the survey week.

About one-third of the 76 non-respondents to the mailed survey were interviewed. One person refused to give any information. The remainder were cooperative and able to report for the farm number selected. The respondents did not object to the ASCS farm serial number as a reporting unit.

Other Results

The response rate and ability to relate to the correct sampling unit was somewhat lower for persons appearing on the list more than once. This was true in both counties although the differences were greater in Rutherford County. No attempt was made to determine the significance of the differences which are presented in Tables 3 and 4.

Table 2.--Reasons for possible errors in mail survey returns, as determined by follow-up interviews

Description of possible	Total	County	
		Maury	Rutherford
	Number	Number	Number
Failed to include leased land	2	2	
Estimated acreage incorrectly	2	2	
Report not legible	1	1	
Report appeared incomplete	2	2	
Report for wrong farm number	2	1	1
Part of farm sold	4	2	2
Mailed to wrong person	3	3	
Reported cropland instead of farmland	4	4	
Failed to insert decimal in total land reported	1	1	
Farm acreage listed by ASCS incorrect	11		11
Reported total operation instead of farm number selected	1		1
Reported cattle on another farm	1		1
Unable to locate & enumerate	1		1
Operator changed - questionnaire returned blank	3		3
Total Number	38	18	20

Table 3.--Response rates, by counties and by number of times respondents were on the list

Category	Questionnaires mailed		Questionnaires returned by mail		Response rate	
	Maury	Rutherford	Maury	Rutherford	Maury	Rutherford
	Number	Number	Number	Number	Percent	Percent
Name on list once	48	51	31	34	65	67
Name on list more than once	52	50	32	28	62	56
Total	100	101	63	62	63	61

Table 4.--Number and percent of respondents reporting correctly, by county and by number of times respondents were on the list

Category	Questionnaires returned by mail		Reported for correct sampling unit		Percent reporting correctly	
	Maury	Rutherford	Maury	Rutherford	Maury	Rutherford
	Number	Number	Number	Number	Percent	Percent
Name on list once	31	34	31	34	100	100
Name on list more than once	32	28	31	25	97	89
Total	63	62	62	59	98	95

Photocopies of individual farms were available in Rutherford County and a portion of the sample received a photocopy of their farm with the questionnaire. As shown in Table 5, the response rate was slightly higher for the group which did not receive a photocopy. There was little difference in reporting accuracy (See Table 6).

Table 5.--Number and percent of mailed responses, by whether a photo of farm was mailed, Rutherford County.

Category	Questionnaires mailed	Questionnaires returned by mail	Response rate
	<u>Number</u>	<u>Number</u>	<u>Number</u>
Photo mailed	44	25	57
No photo mailed	57	37	65
Total	101	62	61

Table 6.--Accuracy of reporting, by whether a photo of farm was mailed, Rutherford County.

Category	Questionnaires returned by mail	Reported for correct Sampling unit	Percent reporting correctly
	<u>Number</u>	<u>Number</u>	<u>Percent</u>
Photo mailed	25	24	96
No photo mailed	37	35	95
Total	62	59	95

Conclusions

The results support the theory that farmers can supply crop and livestock data on a mailed questionnaire for a specific ASCS farm number. Farm labor and other data which normally relate to an entire farming operation might be more difficult to collect using this approach.

Mailing a photo of the farm with the questionnaire did not appear to make much difference in the response rate or reporting accuracy.

Respondent difficulties in associating the proper data with the sampling unit were readily apparent to the editor and, in almost all cases, easily resolved by telephone.

The limited scope of this study prohibits making any general conclusions about the desirability of using this approach instead of the one now used by SRS. However, it does support and justify the need for more work on a larger scale to test the strengths and weaknesses of the ASCS farm number as the sampling and reporting unit.

The large response by mail was possibly due to a number of uncommon characteristics of the study. Further research should be undertaken to attempt to find ways of increasing response rates in mailed surveys. These factors, if known, could have considerable effects on the adoption of multiple frame surveys by the SRS.

Exhibit 1

Budget Bureau No. 60-562099
Approval Expires 12-31-63

TENNESSEE CROP REPORTING SERVICE
P. O. Box 1250
Nashville, Tenn. 37202

U. S. DEPARTMENT OF AGRICULTURE
Statistical Reporting Service
TENN. DEPARTMENT OF AGRICULTURE

Please mail by November 25, 1968

November 1968 Crops & Livestock Survey
U. S. Department of Agriculture, SRS

Community Code Farm No.

REPORTING INSTRUCTIONS: Please reply for the farm identified above. If you no longer operate this farm, give name and address of the new operator in comments and return the blank questionnaire.

Since this inquiry refers only to the farm designated by the above ASCS Farm Number, you may be reporting on only a part of your total farming operation.

Report all crops and livestock now on this designated farm. (DO NOT include crops or livestock on any other land that you operate).

Dear Sir:

The farm identified by the ASCS farm number shown in the box above has been selected by the Tennessee Crop Reporting Service as part of a random sample to represent Tennessee's agriculture.

Please answer the questions and return the form promptly in the enclosed envelope which requires no postage. Your report by mail will reduce survey costs by avoiding the necessity for a personal interview.

Individual reports are kept confidential.

Sincerely yours,

Robert A. Hobson

Robert Hobson
Agricultural Statistician

COMMENTS: _____

Reported by _____

County _____ Date _____

REPORT ONLY FOR THE FARM IDENTIFIED BY ABOVE ASCS NUMBER Answer here

1. TOTAL LAND IN THIS FARM.....acres _____

CROPS ON THIS FARM IN 1968

2. CORN harvested and to be harvested as grain.....acres _____

3. ALFALFA AND ALFALFA MIXTURES, cut for hay.....acres _____

4. CLOVER, TIMOTHY, AND MIXTURES of clover and grasses, cut for hay.....acres _____

5. LESPEDEZA cut for hay.....acres _____

6. BURLEY TOBACCO harvested.....acres _____

LIVESTOCK ON THIS FARM NOW

7. HOGS AND PIGS of all ages.....number _____

8. CATTLE AND CALVES of all ages.....number _____

9. HENS AND PULETS of laying age.....number _____

FARM LABOR ON THIS FARM

10. FARM OPERATOR, how many hours during the week of November 10-16 did you work on this farm.....hours _____

11. OTHER PEOPLE who did farm work for PAY on this farm during the week of November 10-16

a. Number of persons.....

b. Total hours worked.....

November 19, 1968

This is to remind you to complete and return the November 1968 Crops & Livestock Survey questionnaire you received a few days ago.

If you have already submitted your report, thank you. If not, please mail it today.

This survey is part of a research project designed to improve the accuracy of our estimates. Every individual report is important and will be kept confidential.

Tennessee Crop Reporting Service