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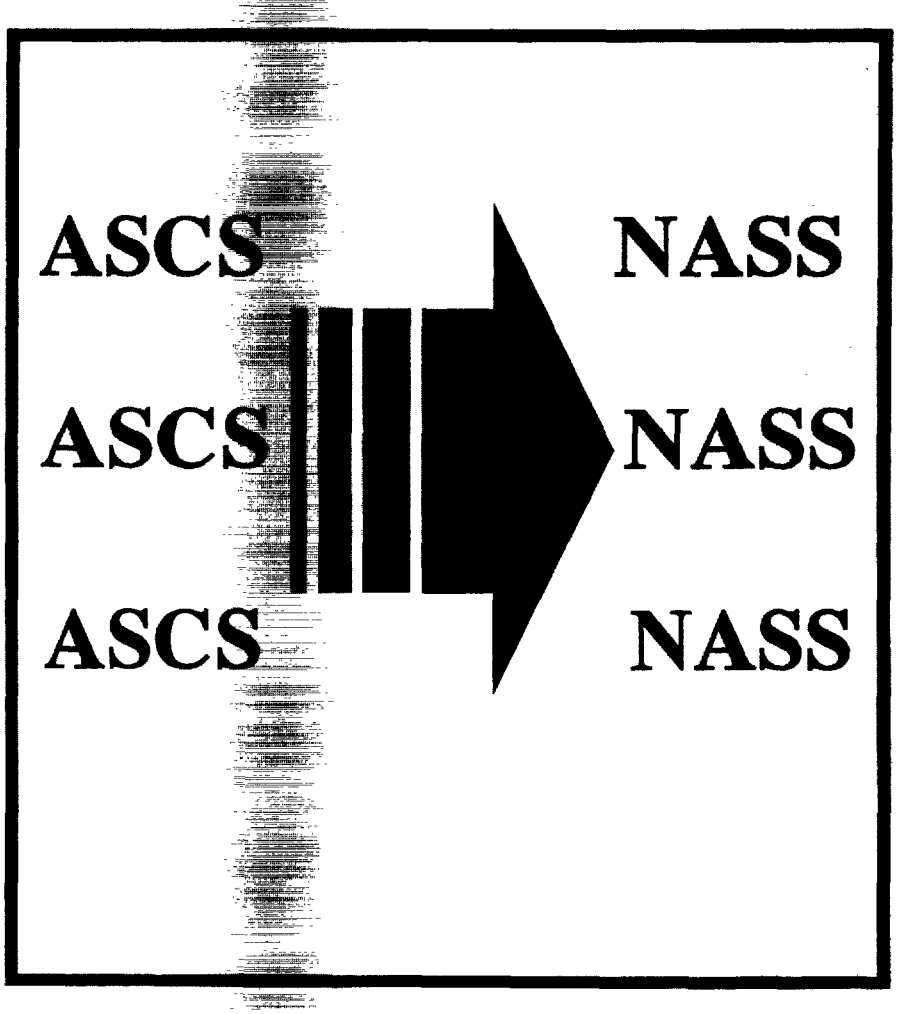
Evaluating the Use of the ASCS List of Farm Operators as a Survey Sampling Frame

William M. Weaver



EVALUATING THE USE OF THE ASCS LIST OF FARM OPERATORS AS A SURVEY SAMPLING FRAME, by William Weaver, Survey Quality Research Section, Survey Research Branch, Research Division, National Agricultural Statistics Service, U.S. Department of Agriculture, Washington, DC 20250-2000, August 1994, Report No. SRB-94-08.

ABSTRACT

In order to fulfill its mission of collecting agricultural information, the National Agricultural Statistics Service must have a list of farm operators to serve as a sampling frame. The Agricultural Stabilization and Conservation Service maintains a list for administrative purposes. Maintaining a list sampling frame of farm operators is an expensive endeavor. These costs could be reduced for NASS if it were able to use the ASCS list of farm operators as a sampling frame instead of maintaining its own.

This paper presents an examination of using the ASCS list of farm operators both as a sampling frame and as a pre-screening tool for the newly rotated in segments used in the large area survey conducted by NASS in June of each year. Kansas, Ohio, Virginia, and Wyoming were chosen for the study to represent geographical and agricultural diversity. Coverage analysis was based on the portion of the area tracts from the NASS June survey accounted for by the ASCS list of operators. ASCS coverage ranged from 88 to 99 percent. The study also examined whether or not farm operators could answer questions over the phone which referred to their ASCS tract ID. The study indicates that most farm operators are willing and able to do this.

KEY WORDS

Sampling frame; Frame coverage; Area frame.

ACKNOWLEDGEMENTS

The author would like to thank the Kansas, Ohio, Virginia and Wyoming State Statistical offices for their earnest participation in the project. The Tennessee and Arkansas State Statistical offices are to be commended for their hard work in the initial activities which led to this research study. Ray Garibay and Carter Anderson also provided valuable suggestions and support during the data collection phase. Thanks to Dale Atkinson for a thorough review of the report and to Roberta Pense for keeping the study headed in the appropriate direction.

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SUMMARY

This study focused on whether or not obtaining the ASCS county lists would benefit NASS for use as a sampling frame or as a name and address pre-screening tool for the June survey. Both ASCS and NASS maintain lists of farmers, and duplication of list maintenance effort could be reduced if the ASCS list of farmers proved to be a viable sampling frame for NASS surveys. The four specific project goals are listed below.

- Compare ASCS frame coverage with NASS frame coverage.
- Determine the out-of-scope portion of the ASCS frame.
- Assess the ASCS names and addresses as a pre-screening tool.
- Determine whether a respondent can/will give ASCS tract data over the telephone.

The sample for this study consisted of all ASCS tracts located either completely or partially within the newly rotated in June area segments for Kansas, Ohio, Virginia, and Wyoming. For this study, each newly rotated in segment was drawn on a clear acetate by SSO personnel. Enumerators took these acetates and the June photos to the ASCS offices where they used county flight line photos to draw the ASCS tracts onto the acetates. Information collected from the ASCS "156-EZ" forms included names and addresses associated with tract and farm IDs, farmland and cropland acres associated with a farm ID, and farmland and cropland acres associated with a tract ID. In this study, we considered the ASCS tract ID as the sampling unit.

The second phase was designed to determine the percentage of name and boundary matches between corresponding ASCS and June tracts. All newly rotated in June tracts were compared to ASCS tracts in terms of reported acreage and boundary similarity. Any tract with matching boundaries, except for a small portion of land (10 percent of the tract or less) designated as non-agricultural (non-ag) in the June survey, was deemed an area match. ASCS and June name matches were categorized based on combinations of operator, owner, and partner.

Less than 50 percent of the June tracts had the same area boundaries as the ASCS tracts in each of the four states in the study. These relatively low percentages are a result of different ASCS and June tract definitions. Had the matches approached 100 percent then the ASCS frame could have used area frame expansion factors.

Out-of-scope acres, or the acreage of an ASCS tract that covered a non-ag June tract, was low for three states, but a little higher for Virginia. It is interesting to note that the two states with the lowest coverage also had the lowest percentage of out of scope acreage. It seems that while the tight ASCS boundary definition of Ohio and Wyoming excluded some farmland, it excluded non-ag land as well.

There was some concern that since livestock is not normally included in any ASCS program, the coverage for cattle and hogs may not be very good. However, the study indicates otherwise. In every case except for one, the ASCS livestock coverage exceeded the NASS LSF coverage. However no livestock control data are attached to the ASCS record. Without these control data, only limited stratification would be possible, resulting in livestock estimates with large variances.

The results of whether or not names and addresses could be used effectively as a pre-screening tool proved more ambiguous than the results for frame coverage. The first major issue here was whether or not the ASCS names and addresses matched the June names and addresses for corresponding tracts. There appeared to be enough matches to conclude that the ASCS names would be a good first contact source.

Determining the cost effectiveness of collecting names and addresses was more elusive, since costs for data collection were not available at the segment level. However, neither Ohio nor Virginia felt that the cost of obtaining the ASCS names and addresses resulted in any savings. Both indicated that because their states had a fairly dense population, it was just as easy or easier for the enumerators to obtain names of tract operators from residents who lived in or near the June segment. Kansas felt the names and addresses were effective for the western half of the state, but not the eastern half. Wyoming with a large number of rural segments with no resident operators, considered the names and addresses an invaluable time and money saver.

Finally, for the final phase of this study, ASCS tracts for Ohio and Virginia which met certain criteria were selected to determine if respondents could answer questions over the phone based on an ASCS tract ID. A portion of these ASCS tracts were area matches with June tracts so direct correlations could be made.

Of the 102 respondents actually contacted for Ohio, there were only four don't knows and eight refusals; for the 32 respondents in Virginia, there were only five don't knows and one refusal. So it seems that respondents are willing and able to give answers over the phone. To gauge how good those answers are, the 35 Ohio ASCS records which were an area match with a June ag tract were telephone enumerated. In most cases, the answers given by the respondents over the phone were very close to the responses given in June. A few outliers resulted when farmers misunderstood the tract level question and responded with entire farm information.

The most promising result of this study was the coverage of the ASCS frame. ASCS land in farm coverage exceeded the NASS list sampling frame (LSF) land in farm coverage in every case. For Kansas, the 99.7 percent coverage was spectacular but not unanticipated since wheat is such a pervasive, uniform ASCS program crop. But the relatively high 88.7 percent coverage for Wyoming is something of a surprise since there are fewer program crops in that state. Coverage results for farm numbers were similar to those for land in farm.

INTRODUCTION

In the spirit of reducing duplication among government agencies, the National Agricultural Statistics Service (NASS) and the Agricultural Stabilization and Conservation Service (ASCS) agreed to a research project in 1992 to examine the possibility of using the ASCS list of farmers as a sampling frame for NASS. Both agencies maintain extensive lists of farm operations complete with names, addresses and agricultural control data.

Maintaining and updating a list of farmers as a sampling frame for every state office is costly for NASS and replacing these state sampling frames with ASCS' county lists could reduce costs considerably. The main objective of this research project is to determine the suitability of the ASCS county lists as a sampling frame. A second objective is to examine the feasibility of using these lists as a pre-screening tool for the June survey.

Each June, NASS conducts a large, general purpose, national agricultural survey consisting of list and area frame samples. The newly rotated in sample units (segments) for the 1993 survey from the area frames in Kansas, Ohio, Virginia, and Wyoming were used to determine the farming operations on the ASCS list to be included in this study. When applicable, data collected by NASS were compared to data collected by ASCS to discover if any differences existed and to estimate how well the ASCS list covered NASS' area frame. A subsample of these farming operations was contacted over the phone to ascertain if they could report crop and livestock data for a unique ASCS identification number (ID).

In this report, characteristics of the differences in the data collected by ASCS and NASS and reasons for those differences are examined for their implications on the usefulness of ASCS lists to NASS for survey sampling. Throughout this report the NASS list sampling frame (LSF) refers collectively to the lists of the State Statistical Offices while the ASCS list refers collectively to lists maintained by the ASCS county offices.

BACKGROUND

One of the theoretical advantages in using the ASCS list in sampling is that its county lists are based on the concept of an agricultural land unit. ASCS defines this unit, designated as a tract, as all contiguous land that is under one ownership and operated as a farm or part of a farm (Common Farm and Program Provisions, 1992). Each ASCS tract is maintained as a separate unit with its own unique identification number, generally without regard to changes in the owner or operator. It changes only when the tract is split among multiple owners. The relative stability of the ASCS tract gives it an advantage in sampling efficiency over the sampling unit for NASS which targets the farm operators.

In July 1992, the NASS Program Planning Committee charged its Research Division to evaluate the use of the ASCS list as an alternative sampling frame in four states representing the west, mid-west, east, and south. Prior to this directive, the Deputy State Statistician in Tennessee had coordinated a limited, small scale project in Tennessee to compare ASCS data collected from county offices with NASS data collected in June (Guinn, 1992). In addition, the Arkansas SSO had used ASCS listings for pre-screening June segments when they received a new area frame in 1992 (Abbe, 1993). The

encouraging results from these activities initiated this research project.

The 1993 project goals were:

1. Compare the coverage of NASS' LSF to the coverage of ASCS' list of tracts for total land, total cropland, total hogs and pigs, total cattle and calves, and number of farms;

2. Estimate the percentage of "out-of-scope" records--ASCS records either matching non-agricultural operations on the area frame or with only "non-operator" names;

3. Determine whether pre-screening new segments using ASCS county office data would improve data collection/reduce costs in a NASS survey;

4. Determine whether a respondent can/will answer questions relating to a specific ASCS tract by telephone.

Because of certain limitations in the study, some of these goals underwent minor modifications.

The obvious dissimilarities in the ASCS and NASS lists are a result of their separate and different missions. NASS is a service organization dedicated to providing the agricultural community with objective and accurate crop and livestock statistics. Sophisticated sampling procedures are used to develop statistics which not only have a high degree of accuracy, but are also cost effective. The list frame, which NASS uses to draw samples for its surveys, was designed for sampling. ASCS, on the other hand, is an agency which implements farm programs, and its list exists for administrative and compliance purposes.

The question then becomes one of whether or not the ASCS list meets the rigorous standards of a sampling frame. Coverage and efficiency of the ASCS list are two of the primary issues this report addresses. There is some concern that since some farmers do not participate, either by choice or because their crops are not covered by ASCS programs, the ASCS list is too incomplete to serve as a survey sampling frame and would not work well for estimating non-program crops and livestock. The quality and availability of control data are also of concern since these would be used to stratify the population to reduce sampling variance (Cochran, 1977).

METHODS

The initial sample for this research project consisted of all ASCS tracts located in the newly rotated in area segments for the June survey. This not only included the ASCS tracts completely contained within the June segment boundary, but also those ASCS tracts located partly inside and outside the June segment. Four states, Kansas, Ohio, Virginia, and Wyoming, were selected to represent different agricultural regions of the country. Although the original survey design and project overview described two phases, there were in fact three phases to the study reflecting the three different sources of data collected. These phases are described in the following paragraphs.

MARCH PRE-SCREENING. The first phase consisted of identifying ASCS tracts located either completely or partially in the June Agricultural Survey segments. To facilitate this, a large, square piece of acetate was placed over the June photo for the sampled segment and the segment boundary was traced onto the acetate. The

State Statistical Offices sent acetates and the corresponding June aerial photos to the field enumerators, who then took them to the ASCS county offices. There they located all of the associated ASCS tracts using the corresponding ASCS flight line photography.

To aid in identifying an individual tract, both the tract and farm identification numbers associated with that tract were recorded. The enumerators then collected tract and farm level inventory data from the ASCS "156-EZ" forms. The tract level data consisted of total tract acreage and the crop acreage within that tract. The farm level data consisted of total farmland and cropland associated with the primary operator listed on the EZ form. This information was used to evaluate the ASCS list as a sampling frame. For an example of the survey instrument, see Appendix A.

JUNE SURVEY. During the second phase of the survey, enumerators were given names and addresses associated with the ASCS tracts collected in the first stage as an aid in pre-screening for the June Agricultural Survey. However, neither the "156-EZ" forms nor the acetates with the ASCS tract boundaries were provided to the enumerators because of concern it would bias the results. Enumerators were requested to write comments as to whether or not the ASCS names and addresses were helpful.

Personnel from Headquarters were sent to each of the four states to evaluate data from the June questionnaires and aerial photos with the corresponding acetates showing the ASCS tracts. This procedure involved determining if ASCS and June tract operators were the same and visually comparing tract boundaries to determine whether the ASCS tracts matched the June area tracts. In addition to ASCS tract level matching information, segment level information were collected for number of tracts and total acres out-of-scope. A Blaise software instrument was used to edit the collected information. The following data were collected (see Appendix B).

1. June Tract ID: For the June Survey, NASS defines a tract as an area of land, located within the sampled area segment, and under one type of land operating arrangement. Since the segment is completely enumerated, every area of land in the ASCS program that is included in a June segment has a unique June tract ID designation.

2. ASCS Farm ID: Unique (within a county) identifying number for a farm.

3. ASCS Tract ID: Unique (within a county) identifying number for a tract.

4. Area Match Indicator: To determine whether or not the ASCS and June tract boundaries were the same, a visual inspection was made and an indicator value was entered. If the boundaries were the same except for a small portion of land (10 percent or less) designated as non-agricultural (non-ag) in the June survey, it was deemed an area match.

5. Acres Not Covered By ASCS: This is the portion of June tract acreage not covered by the ASCS tracts. This amount must be less than or equal to the June tract acreage.

6. Name Match Indicator: Names associated with an ASCS tract were compared to the names attached to

the June tract. Indicator values were used for June operator to ASCS operator matches; June operator to ASCS owner matches; June partner to ASCS operator matches; June partner to ASCS owner matches; and no discernable match.

7. AG vs NON-AG Indicator: This indicator was used to determine whether or not a June tract was designated agricultural or non-agricultural.

8. Number of out-of-scope ASCS tracts: If an ASCS tract was not associated with any June ag tract, it was designated as out-of-scope; the number of ASCS out-of-scope tracts were recorded at the segment level.

9. Amount of out-of-scope acreage: The amount of ASCS tract acreage, either partial or total, associated with non-ag June tracts was recorded at the segment level (see Appendix E).

Data collected from the ASCS county offices during the June Agricultural Survey were combined and analyzed to create coverage, correlation, and summary statistics. Summary statistics for ASCS and NASS tracts were generated with comparisons based on whether or not a June tract and an ASCS tract had matching names or areas (boundaries).

In some cases, June tracts included multiple ASCS tracts, each with different names located in a June tract. If the June tract operator name matched any of the ASCS tract names, the June tract name was considered matched. The remaining non-matched names were eliminated from the frequency counts, since for this study, pre-screening success hinged only on obtaining the June tract operator name from the ASCS records. For this reason, a non-match/match indicator value was used instead of recording the number of ASCS tract names that did or didn't match a June tract name. Area matches by definition could only have one associated ag tract. Any ASCS tract which exceeded the June segment boundary was considered a non-match with the June tract which is by definition confined within the segment. (see Appendix C).

ASCS coverage statistics were created by subtracting the amount of the June tract acreage not covered by an ASCS tract. The resulting acreage was then multiplied by the NASS tract expansion factor. This number summed across tracts was then divided by a sum of the June tract expansions for newly rotated in segments and converted to a percentage (see Appendix D). ASCS livestock coverage was calculated using a similar approach (see Appendix D). ASCS farm number coverage was computed by summing the expansion factors for June tracts completely or partially covered and dividing by the sum of June expansion factors for all tracts in the newly rotated in segments (see Appendix D).

For land in farm and number of farms, NASS LSF coverage statistics were from the 1992 List Frame Evaluation Book, also known as the Redbook (Gueder, 1993). Redbook figures for livestock coverage were not available; therefore, for these commodities, values of NASS LSF coverage were calculated based exclusively on the formula in Appendix D. The estimate of the NASS LSF coverage, regardless of the formula, was based on all of the segments in the June survey.

For this study, calculated means of June Agricultural Survey and ASCS tract and farm data were straight averages. Design based C.V.s were not calculated since the sample sizes were so small. Pearson's correlation coefficient was used to examine the relationship between ASCS and the June Ag Survey variables at the tract, crop, and farm levels.

Since the data collection of all cropland acres was not required for the overlapped June tracts, these data were completely missing from the Ohio data file and may have been excluded on a record by record basis in the other three states in the study. For this reason it would have been extremely difficult to identify legitimate cropland zeros for the overlapped June tracts. Therefore, any June tract with zero cropland was eliminated from the summary statistics for cropland. The loss of these zeros results in an inflated value for the cropland average.

FALL FOLLOW-UP. The final stage of data collection involved selecting a subsample of ASCS tracts from Ohio and Virginia and contacting respondents via telephone to see if they could answer questions based on their ASCS tract ID. The subsample included ASCS tracts matching June ag tracts on either area or name which had responded in June, and which were not identified as survey extreme operators. These large operators were excluded from the sample to minimize respondent burden. ASCS and June tracts which were exact matches were marked so that data collected in the June survey could be compared to similar data collected from farmers in the fall follow-up survey.

Pre-survey letters were sent by both the Ohio and the Virginia State Statistical Offices (SSO) describing the project and emphasizing that the data were to be collected by ASCS tract ID. The Ohio SSO included the actual ASCS tract ID in the body of its letter (see Appendix G).

The data collection instrument (see Appendix F) incorporated both cognitive and quantitative questions. The cognitive questions were designed to assess characteristics associated with collecting this type of data; the quantitative inventory questions were similar to the ones asked on the June Ag Survey questionnaire but were based on the ASCS tract ID.

Since NASS normally collects total farm information over the phone, enumerator training in both states concentrated on how to ask and prompt for tract level data. Names and addresses were generated from the "156-EZ" forms and enumerators were allowed to prompt with the names of tract owners when they were different from the listed tract operators. However, enumerators were not allowed to tell the operator the acres listed on the "156-EZ" forms for a particular tract ID.

Due to the relatively small sample sizes, analysis was limited to micro-level observations. Ordered observation spike diagrams showing differences in values for similar variables from the three data sources were produced. These provide a visual assessment of the data without obscuring large or small differences for the individual observations. In addition, paired comparison charts were created displaying multiple data sources for each unique observation.

RESULTS

SCREENING

An overview of the characteristics of the ASCS/June Ag Survey study sample,

which focused on the newly rotated in segments for the 1993 June Ag Survey, is presented in Table 1.

The fact that only 41 to 66 percent of ASCS tracts are totally contained within the segment boundaries provides a clear indication that the ASCS tract definition is different from the NASS definition. Fence lines and shallow ditches which may be suitable for NASS' segment borders are sometimes ignored when determining the ASCS tract boundaries. Kansas, with well defined 640 acre sections, has the highest proportion of ASCS tracts contained completely within the June segments while Wyoming, with large tracts of rangeland, has the lowest.

The large number of ASCS tracts which extend beyond the segment boundaries, presents problems in using the June segment expansion factors as weights for the ASCS tracts. The correct expansion numbers for the ASCS tracts would have to be based on the ASCS list as a sampling frame (Houseman, 1975).

A primary objective of this study was to evaluate the quality of the names and addresses obtainable from ASCS through their "156-EZ" forms. In addition to the name and address of the primary operator of an ASCS tract, this form also contained the owner of the tract, which in many cases was the same as the primary operator. All such names were considered in determining whether or not a match existed between the names from the ASCS list and the names from the June Ag Survey.

There were high percentages of name matches between June and ASCS tracts in the four study states (see Figure 1). These high percentages suggest that the ASCS names and addresses would be a good first source of contact. Initially it was thought there would be a number of different name combinations, but in fact only a few combinations were not direct operator to operator matches. Even the non-matches could provide enumerators with useful information since many were non-operating owners who knew the operator of the tract.

Contributing effects to the number of non-matches include the loose interpretation of tract operator by ASCS and the use in this study of operator names which hadn't been updated from the previous year. It is not unusual for an owner to rent his land to different people from year to year and since the ASCS information used in this study was a year old, updates for the 1993 season were not accounted for.

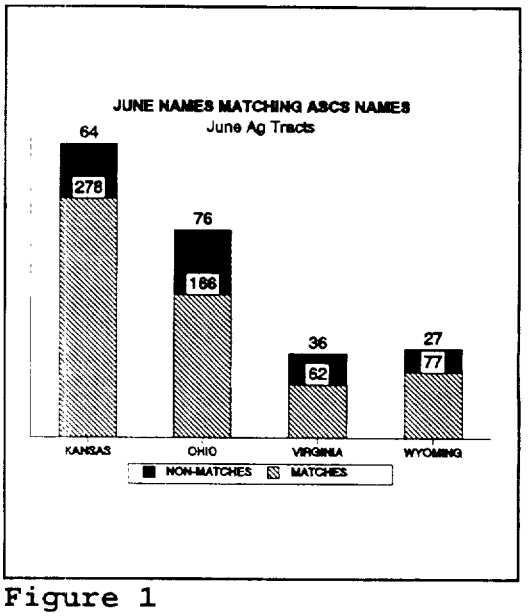

Figure 1

Determining whether or not obtaining these names proved cost effective was not so easily determined. A comparison of the cost for enumerating the 1993 newly rotated in segments with the cost of enumerating newly rotated in segments for previous years would have been the best

Table 1: ASCS/NASS Sample Statistics

	Kansas	Ohio	Virginia	Wyoming
No. of Segments Sampled	90	56	46	52/28 1/
Total No. of June Tracts	461	548	486	297
Ag Tracts	342	243	98	156/104 1/
Tracts with Matching ASCS Names	278	166	62	77 1/
Tracts with Matching ASCS Area	131	65	11	13 1/
Total No. of ASCS Tracts	416	306	173	344
Tracts Completely Contained Within Segment	273	179	83	140
% of Total	65.6	58.5	48.0	41.2
No. of Fall Phone Follow-Up Tracts	N/A	105	46	N/A
No. of ASCS/June Tract to Tract Records	N/A	35	7	N/A
Average Segment Size (Acres)	273	507	393	7917

1/ Total ASCS tracts/usable ASCS tracts. Since NASS quad maps did not provide enough detail to match ASCS and NASS tract boundaries, only the 28 segments with NASS photography were used in the matching tract analysis.

method to determine cost effectiveness. However, separate enumeration costs for new segments were not available. Therefore the determination of whether the cost of sending enumerators to the ASCS county offices was recovered by reducing the amount of time to enumerate a June segment was based on comments and evaluations from the field offices.

Personnel from both the Ohio and Virginia offices indicated that obtaining the names from the ASCS county offices wasn't cost effective. This is primarily because these states are so heavily populated that it is easy to find someone living in or near the segment who is familiar with the names of the tract operators. Kansas personnel said that it was not cost effective for the

eastern part of the state for the same reason given by Ohio and Virginia. However, for the more sparsely populated western part of the state, it was cost effective. Wyoming considered obtaining the ASCS names and addresses exceptionally cost effective as a pre-screening tool and they plan to continue this for future surveys.

The above evaluations are largely an artifact of the states' characteristics. The average new segment size in Wyoming is 8000 acres and 27 of the 52 segments that were newly rotated in did not have a single resident (see Figure 2). Kansas also has a large number of segments without any resident operators. This is not true with Virginia and Ohio where there are numerous residents in or near a segment to provide the same information that the ASCS names and addresses provide.

COVERAGE

An important statistical component in determining the efficacy of using the ASCS list as a sampling frame is its coverage of the June area frame. The more complete the coverage the more acceptable this frame. NASS employs two definitions of frame coverage. One definition considers overlap only those records which have been classified for the June Ag Survey. The second definition, used in NASS' annual list frame review (Redbook), considers any matching active record as overlap regardless of whether or not it was classified for the June Ag Survey. Because this second definition is more inclusive than the first, it will usually result in a higher coverage percentage. The pie charts in Figure 3 on the following page visually compare the ASCS coverage with the NASS LSF coverage using the Redbook (Geuder, 1992).

When considering these data, it is important to point out the differences between the ASCS and NASS coverages. The overlap determination between the ASCS list of tracts and the June area frame is based on an area of land. In contrast, the overlap determination

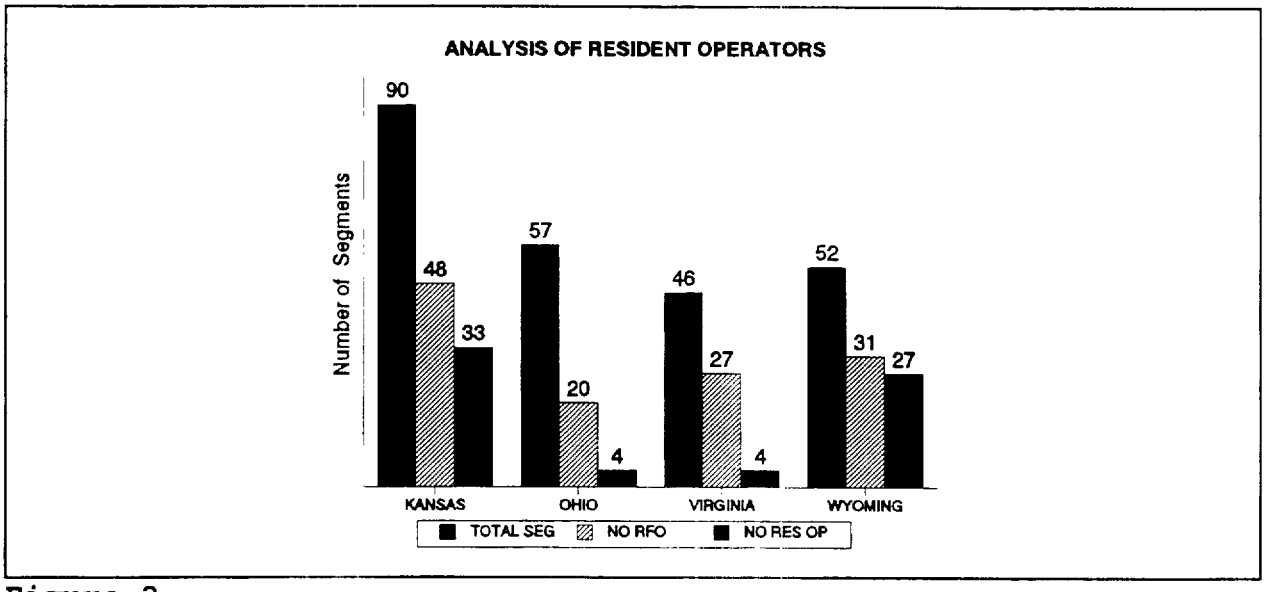

Figure 2

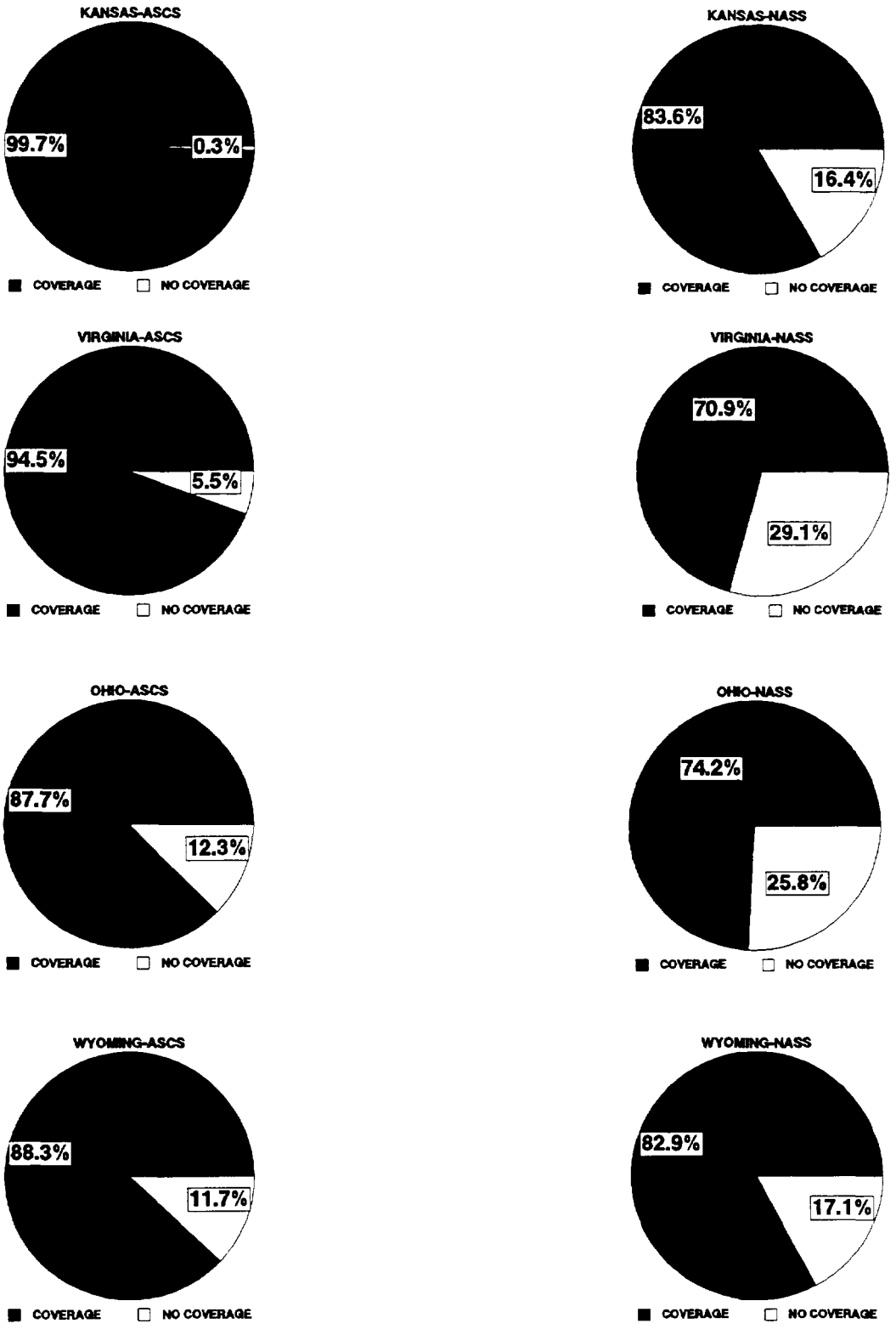

Figure 3 Percentage of ASCS and NASS 1992 Redbook Land in Farm Coverage.

Table 2: Indicated Coverage Percentages of Key Agricultural Characteristics

	Kansas	Ohio	Virginia	Wyoming
Land In Farm				
ASCS	99.7	87.7	94.5	88.3
NASS LSF 1/	83.6	74.2	70.9	82.9
No. Of Farms				
ASCS	98.8	86.7	89.0	96.2
NASS LSF 1/	75.5	58.5	48.0	41.2
Hogs				
ASCS	100.0	99.9	87.6	N/A
NASS LSF 2/	90.5	80.4	95.2	N/A
Cattle				
ASCS	99.9	80.0	95.3	88.3
NASS LSF 2/	79.9	61.1	81.4	69.9

1/ Redbook coverage definition.
2/ June Ag Survey coverage definition.

between the NASS list (for both overlap definitions) and June area frame is based on the operator name. In essence, the ASCS list of tracts is an incomplete agricultural area frame and because area comparisons are made, proportional adjustment factors are used. For example, if an ASCS tract covered 67.4 acres of a June tract containing 100 acres, the adjustment factor would be .674.

Another difference in the coverage comparison lies in the fact that in determining the ASCS coverage only the newly rotated in segments were used. This was 20 percent of the segments in Kansas, Virginia, and Ohio and about 10 percent in Wyoming.In all four states, coverage was highest for the ASCS list (see Table 2). The 99.7 percent coverage of land in farm for the ASCS list in Kansas is spectacular and can be explained by the fact that wheat is an ASCS program crop grown in large, uniform areas throughout the state. Ohio, with the lowest ASCS coverage, has a more diverse agriculture and many crops grown there are not in any ASCS program. Therefore the producers of these commodities are not included in the ASCS list. Even Wyoming with its emphasis on cattle showed close to 90 percent coverage of land in farm.

No attempt was made in this study to examine the ASCS coverage of non-program crops such as fruits and vegetables. These less common and less uniformly distributed crops may present a

problem if the growers do not also have ASCS program crops. The NASS list frame attempts to include all operators regardless of the agricultural commodity produced.

A related issue of concern here is the generation of livestock estimates, which rely heavily on the list component of the NASS survey indications (Nealon,1984). List sampling for major crops is of a lesser concern, since NASS' June crop planted acreage estimates rely mostly on area frame indications.

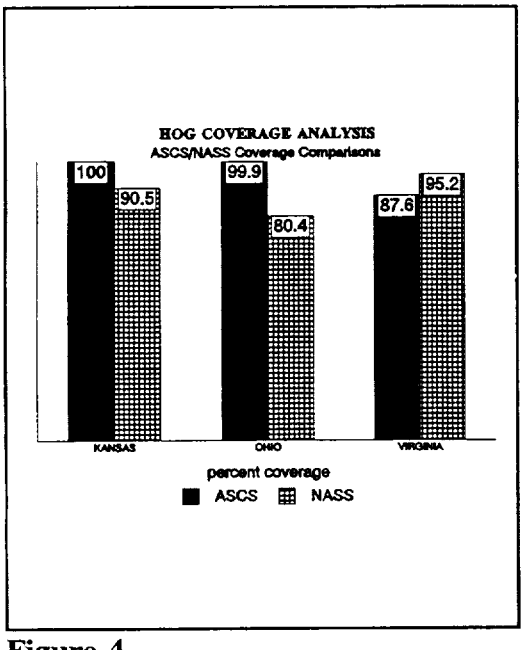

Figure 4

To determine the ASCS coverage for livestock data, expansions of tract level hogs and cattle were generated using the formulae in Appendix D. The formula for hogs is very similar to the one for land in farm. However, the one for cattle takes into consideration the potential for cattle movement across the segment boundary and PIGA cattle in Wyoming. The NASS estimate of livestock coverage relied on the June area overlap/non-overlap indicator to uniquely associate each operation with the correct overlap or nonoverlap domain.

Figure 4 shows that the ASCS hog coverage is higher than the NASS coverage in Ohio and Kansas, but lower in Virginia. Wyoming was excluded from the hog analysis since only one June record in the newly rotated in segments had hogs. Figure 5 indicates that the NASS frame is not nearly as complete as the ASCS list for cattle. Initially, there was concern that because cattle and hogs were not included in any ASCS program, livestock producers would not be well represented in the frame. It appears though, from this study

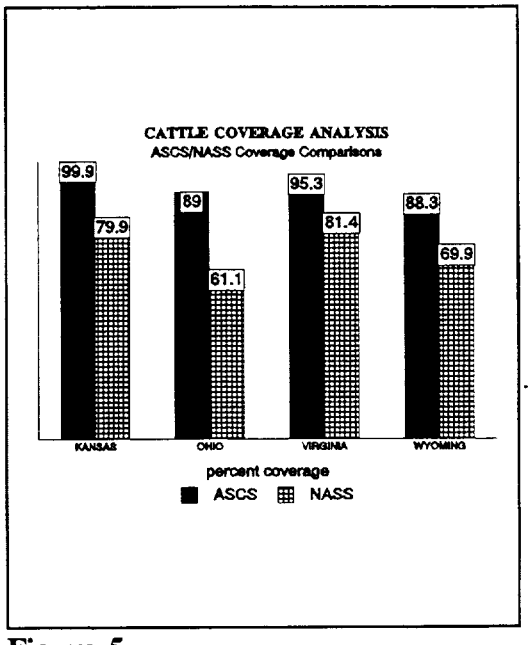

Figure 5

that the ASCS list does a better job of including these livestock farms than the NASS list frame. This may partially be due to the fact that many cattle ranchers sign up for the ASCS hay and pasture programs.

Also, the ASCS tract changes much more slowly than does the person operating a particular tract of land who may be in business one day and out the next. Unlike

field crops which require a long term investment in heavy machinery, getting into the cattle and hog business may be done with a minimum of capital outlay. Land and livestock trailers can be rented, and hay can be purchased which, though not very efficient, reduces the need for a lot of initial investment and makes it easy for individuals to quickly get in or out of the business. It is much easier to sell livestock than it is to auction off machinery used for growing crops. Figure 6 presents a state by state profile of those ag tracts not covered by the ASCS list.

Farm type and gross value of sales are from the economic data section of the June survey questionnaire, and, except for Ohio, a large portion of those not covered by the ASCS list are livestock operations. The expanded coverage estimate used is a function of both the number of uncovered tracts and the number of livestock on each tract. Although it is true that uncovered tracts were predominantly livestock type farms, the expanded inventory numbers were so low that the uncovered tracts were, in general, not influential contributors to the total expanded sum.

The fact that the coverage for livestock is

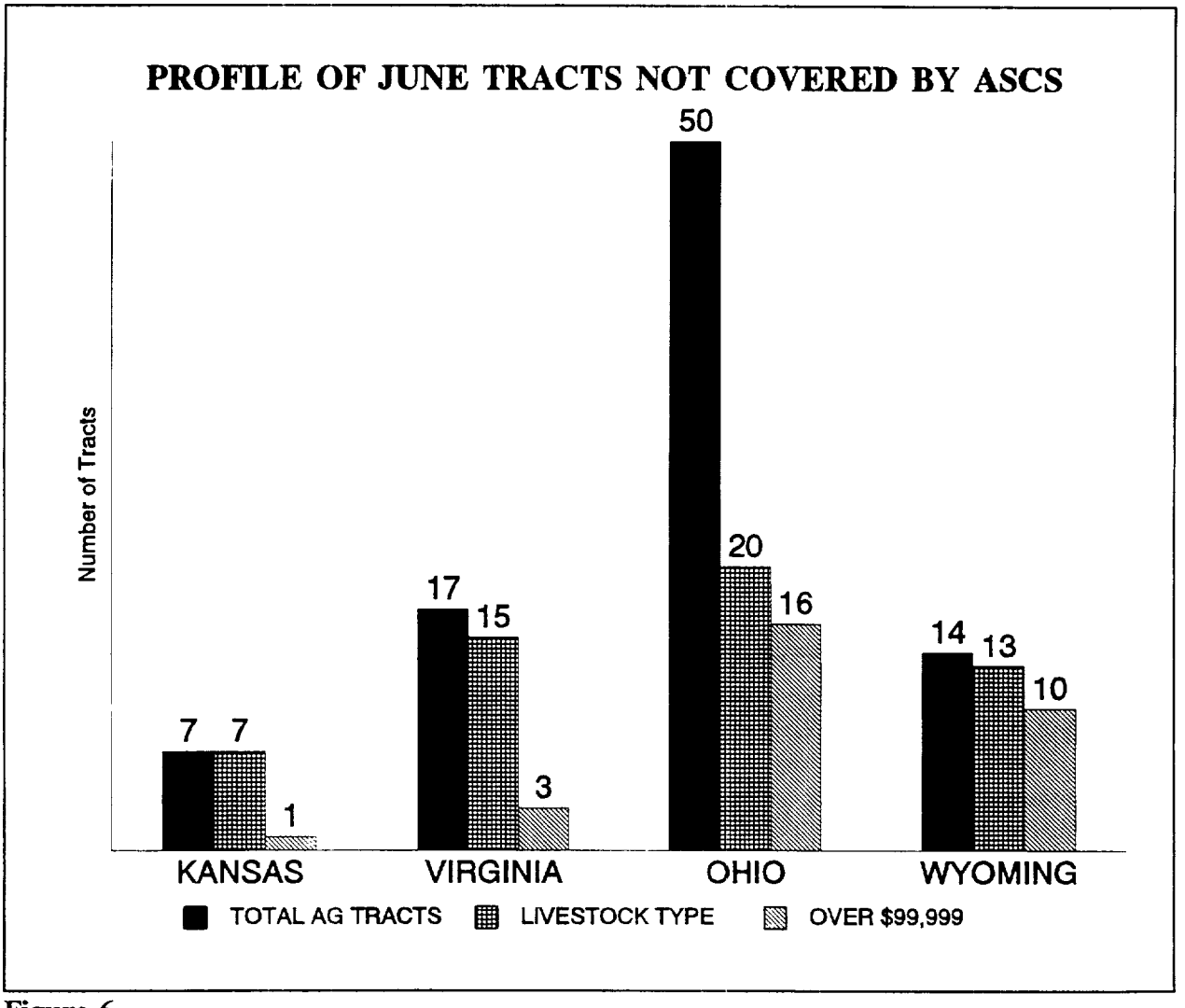

Figure 6

better with the ASCS list than with the NASS list frame does not necessarily make it a better sampling frame. The biggest problem with using the ASCS list for cattle and hogs is that there is virtually no livestock control data attached to the ASCS records. This means that inventory stratification would not be possible, resulting in large sampling errors (Cotter and Nealon, 1987).

Since NASS currently uses ASCS control data in maintaining its list frame, the quality of the ASCS data is a concern. The accuracy of sampling frame control data is vital for proper stratification. Examining the relationship between the ASCS control data collected during the initial visit in March with comparable data collected during the June survey provides insight into the quality of these data.

When NASS obtains control data from ASCS, it combines data from multiple ASCS records based on either SSN or EIN (Anderson, 1993). Since frame coverage was the primary focus in this study, this procedure was not used. Instead the control data attached to a unique ASCS farm identification number was compared against the whole farm acres reported in the June survey. Considered this way, the ASCS farm control data are biased downward because farm identification numbers do not carry over from one county office to another. Thus a farm operator with farm land in two counties could have two farm Ids.

Table 3 includes the correlations between the ASCS tracts and the June ag tracts that were visually identified as having the same boundaries (area matches). For Ohio, Kansas, and Wyoming the tract acreage correlation is very high, reflecting the close correspondence between NASS and ASCS tracts. The NASS tract to ASCS tract correlation for Virginia is lower but this appears to be largely due to enumerator error instead of faulty ASCS control data. The small sample size allowed a couple of records to drive the correlation down.

Although tract to tract correlations are based on area matches, all cropland (not just tract cropland) and total farmland in Table 3 are based on name matches. The ASCS average for each match category is lower in every case than the corresponding June survey average for all four states.

Since cropland acres was not always keyed for overlap operators in the states in this study, only non-overlap observations and overlap observations with positive cropland acres were analyzed to avoid correlating invalid zeros. This is why there are more total farm observations than there are total cropland observations, and why there are fewer Ohio cropland observations than there are tract observations. Part of the reason for the low correlations for farmland and cropland may be due to the fact that the ASCS information is a year old and does not reflect any change for the current year.

The out-of-scope statistics for the NASS LSF are reported in terms of percentages of records. A record is considered out-of-scope when it is erroneously identified as an active farm on the list frame. By contrast, instead of an out-of-scope 0/1 indicator, the ASCS tract sampling unit lends itself to the use of a proportional out-of-scope acreage statistic (see Appendix E). Out-of-scope acreage is ASCS tract acreage which covers non-ag June tract acreage. The percentage of out-of-scope acreage impacts the efficiency in stratification and the quality of survey indications. Figure 7 shows the percentage

Table 3: Characteristics of Matching Tracts in the ASCS/NASS Study

	Kansas	Ohio	Virginia	Wyoming
MATCHING TRACTS				
Sample size	131	65	11	13
Acres per tract				
ASCS(C.V.)	151(5.8)	81(7.2)	37(21.8)	257(20.1)
June(C.V.)	152(6.0)	82(7.1)	50(20.3)	248(19.4)
Correlation	.98	.97	.78	.99
MATCHING NAMES				
Cropland Acres				
Sample size	238	44	59	70
Acres per name				
ASCS(C.V.)	475(9.4)	135(2.8)	206(34.4)	593(14.0)
June(C.V.)	1004(1.0)	248(19.5)	327(25.3)	818(14.9)
Correlation	.52	.64	.61	.74
Farmland Acres				
Sample size	273	149	60	70
Acres per name				
ASCS(C.V.)	814(8.8)	323(9.3)	538(30.2)	6473(20.6)
June(C.V.)	1620(7.0)	639(8.8)	654(29.0)	7838(20.7)
Correlation	.69	.34	.44	.34

of out-of-scope acreage and coverage for June tracts for each state.

The 19 percent value for out-of-scope acreage in Virginia may indicate that the ASCS county offices chose a less discriminating outline for tract boundaries or that a number of changes occurred after the tracts were created. The fact that 31 of the 46 sampled segments reported out-of-scope acreage supports a shifting ag versus non-ag land use profile of Virginia.

In theory, a less discriminating tract definition would tend to increase coverage since it reduces the chance of excluding ag acres incorrectly identified as non-ag. This appears to be the case for Virginia with a 95 percent coverage. The converse is true in Ohio which only had 1 percent of its acreage out-of-scope and a lower coverage of 88 percent. The low 3.1 percent out-of-scope acreage and the high 99+ percent coverage of Kansas is a reflection of the pervasive, homogeneous, and stable

agricultural character of its land usage.

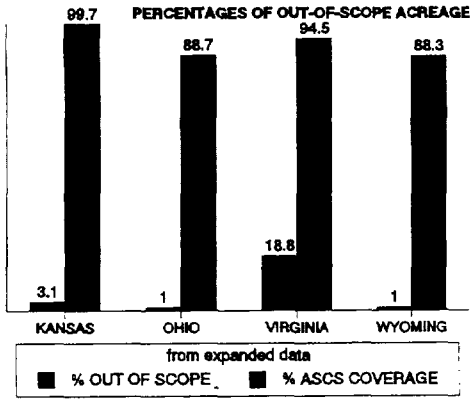

Figure 7

TELEPHONE DATA COLLECTION

While adequate coverage by the ASCS list is necessary for statistical soundness, determining whether or not tract operators can report tract level data over the phone is necessary for logistical soundness. One of the concerns about the ASCS names was that the name listed may be an owner's name (who might not be able to give the information about the ASCS tract) and not the operator's name. The final phase of this study was designed to address this issue.

The results from this final phase were somewhat inconclusive due to three factors: 1) the small sample size; 2) extreme operator sample bias; and 3) the inconsistency of the reported data. To reduce response burden, extreme operators were excluded from the sample, introducing a potential size bias in the data. Refusals were also excluded from the selection. Of the remaining tracts, all that were name or area matches were included in this third phase subsample.

In Table 4, it is shown that 75 Ohio respondents initially said they made the day to day decisions for the selected ASCS tract. Each of the 11 who said they did not operate the tract, either knew the name of the operator or indicated that the land was no longer in an ASCS program. For Virginia, 26 respondents said they did make the day to day decisions for the tract, while only one said no. In addition, only four Ohio respondents and five Virginia respondents said they didn't know if they operated the ASCS tract. This indicates that most respondents are able to answer by phone as to whether or not they operate a particular ASCS tract. Refusals represented about 7 percent and 3 percent of the sample size for Ohio and Virginia which suggests that respondents were generally willing to report data by ASCS tract ID. This is strong evidence that the names on the ASCS list are a good first contact source.

Given the response results, it seems that respondents are generally both willing and able to give ASCS tract data over the phone, so now the issue becomes one of whether or not the data are accurate.

To study individual crop comparisons between June tracts and ASCS tracts, only non-EO, non-refusal area matches were considered. This resulted in 35 and 7 observations available for contact in Ohio and Virginia, respectively (see Table 4). The bias introduced by excluding extreme operators is important since those operators will tend to have more ASCS tracts, possibly making it more difficult to report for individual tracts.

Figures 8 through 11 display the differences between June tract acres and comparable ASCS tract acres as reported during the fall follow-up telephone interview. The observations are ordered on the size of the differences, emphasizing that there was a tendency to over-report the tract acres during the fall follow-up telephone interview. An examination of the

Table 4: Fall Phone Follow-up Response Frequencies

	Ohio	Virginia
Fall Tracts Selected	105	46
Inaccessibles	8	14
Refusals	8	1
Do you make the day to day decisions for ASCS tract ID_____?		
Yes	75	26
Don't know	4	5
No	11	1
(Renting land out)	(6)	(0)
(No longer renting land)	(2)	(0)
(Other)	(3)	(1)
Number of "No" responses from the first person contacted	5	0
AG tracts not in ASCS Program	8	2
Records used during interview	48	11
Number of tracts where farm operator responded 1/	89	29
ASCS/June matching tracts.	35	7

1/ Includes successful follow-up interviews

three obvious outliers in Figures 8 and 9 indicates that the respondents gave entire farm information instead of tract information. Allowing the enumerator to use ASCS tract acres as an editing tool could have eliminated these outliers.

The observations in Figures 12 through 14 are tract differences for corn, soybeans, and wheat for Ohio. Virginia was not analyzed because there were so few positive responses for these crops.

In reviewing these data, the large number of outlier observations at the negative end of the spectrum (follow-up data larger than June data) again emphasizes the skewed nature of the data. These large negative outliers are a result of the operator apparently reporting entire farm crop acreage instead of tract crop acreage despite the fact that the enumerator stressed tract acreage only. Again, though enumerators had access to the ASCS tract level data and knew the ASCS reported acreage in the tract, they were told only to probe when an inconsistency occurred in the reported data but not to actually cite the ASCS tract acreage. The same Ohio respondents that reported total land outlier data appeared as cropland outliers as well.

For all tracts in the telephone follow-up survey, a comparison was made between

the ASCS tract data collected from the county offices in March and the ASCS tract data collected during the fall follow-up survey. These differences are displayed in Figures 15 through 18. Again, respondents who over-reported their acreage during the phone follow-up survey accounted for a large portion of the outliers. However, there also exist tails at the opposite end indicating an under reporting of ASCS tract data in the fall.

Although it may be true that the ASCS data collected from the county offices may be incorrect, it is more likely that the fall follow-up telephone respondent gave incorrect tract acreage due to a lack of familiarity with the ASCS tract or a misunderstanding of the intent of the inventory question. For under-reported total tract acreage, respondents may report only acres they actually grow crops on even though they rent a larger area of land.

Many of the same records which produced the wildly aberrant differences between the June reported acres and the ASCS acres produced the same problem when compared with ASCS office data. Some of the tract crop differences could be due to the fact that the crop data was a year old and didn't reflect possible 1993 changes.

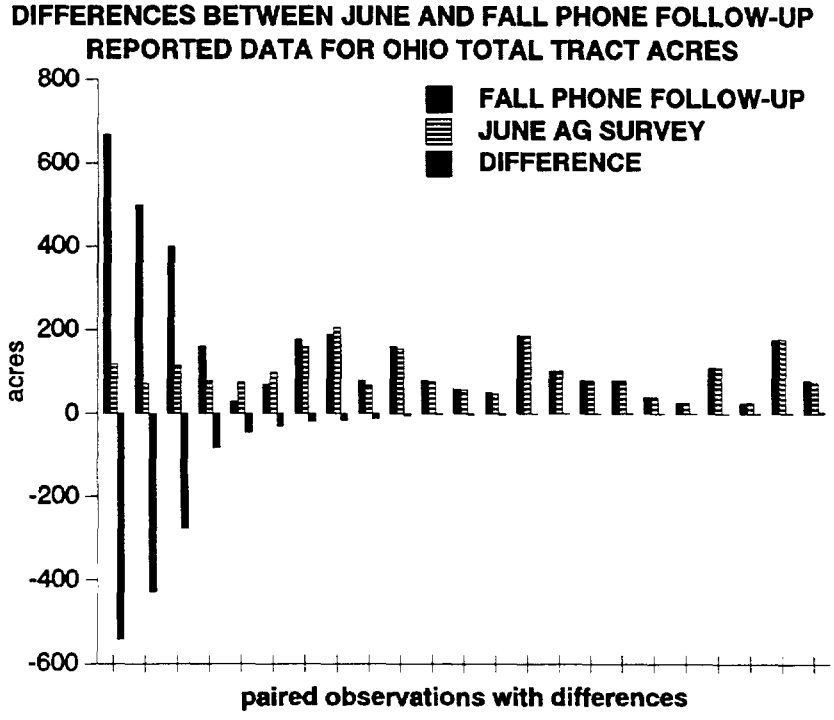

Figure 8

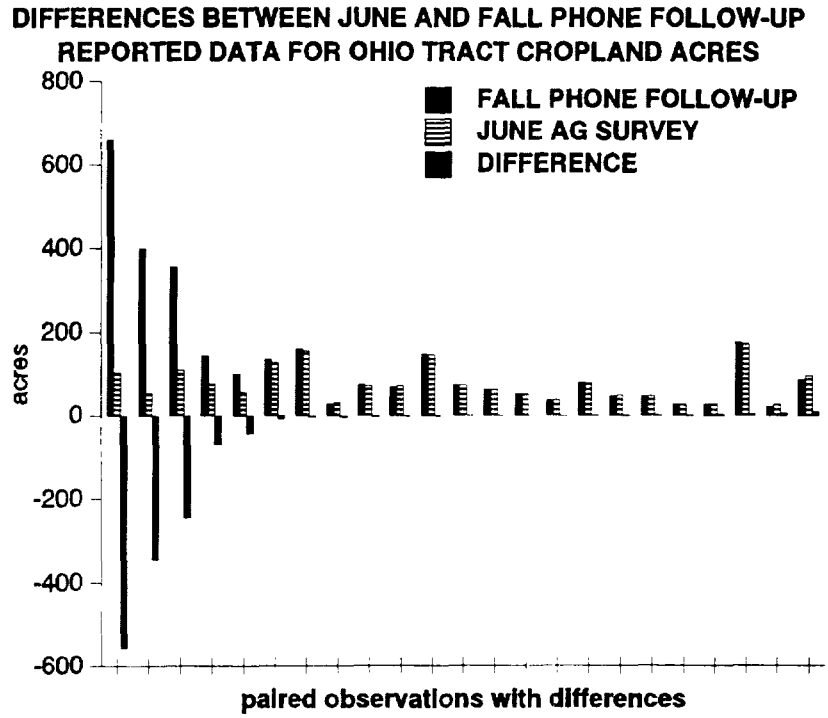

Figure 9

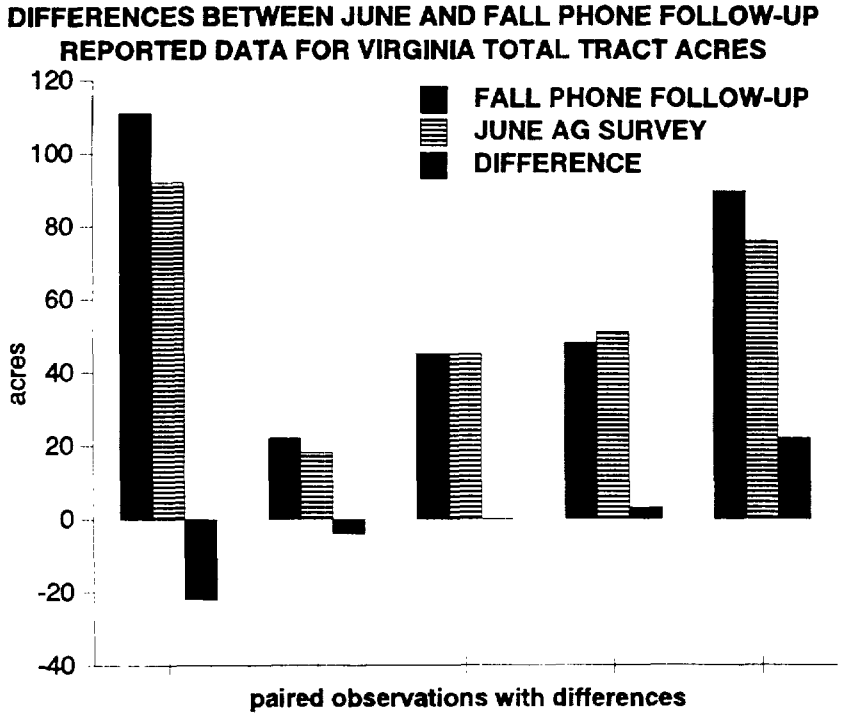

Figure 10

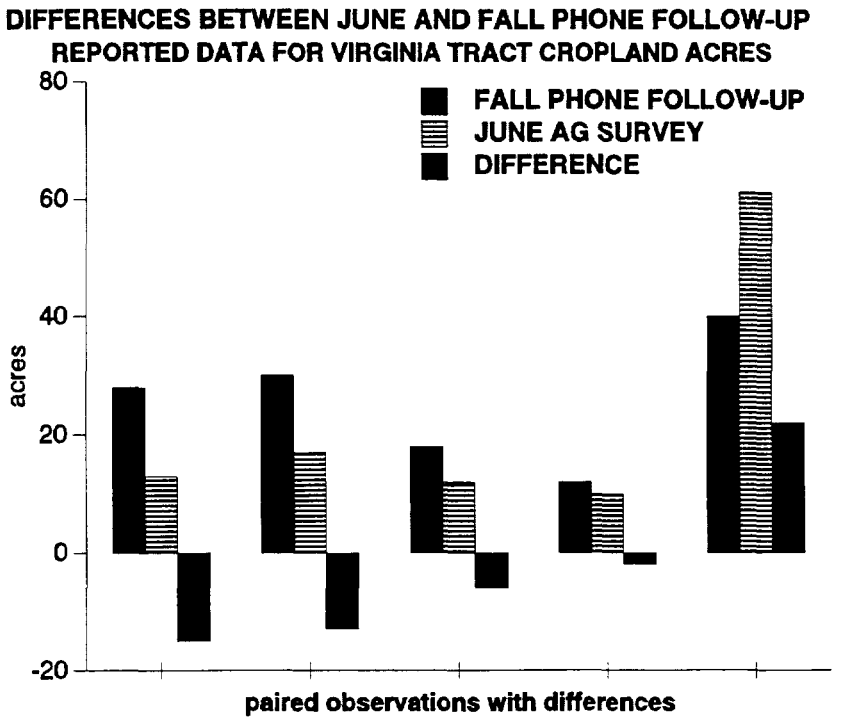

Figure 11

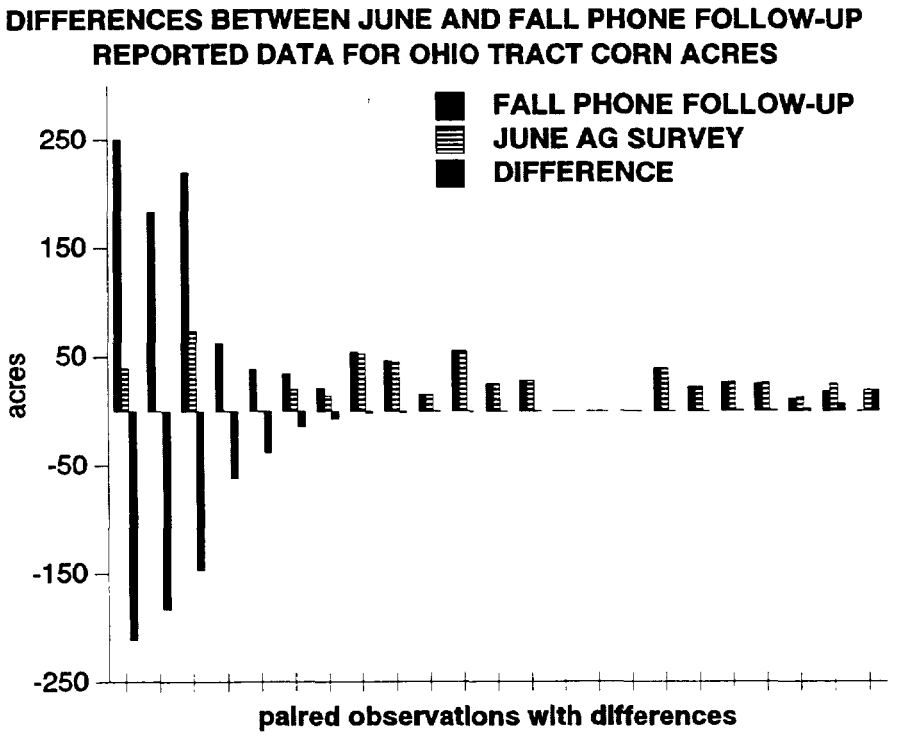

Figure 12

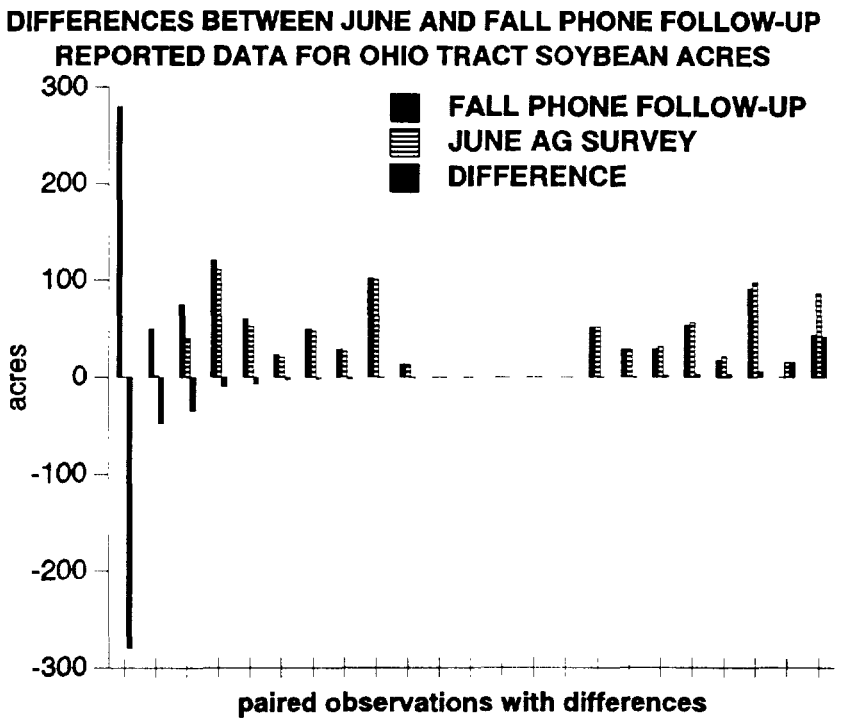

Figure 13

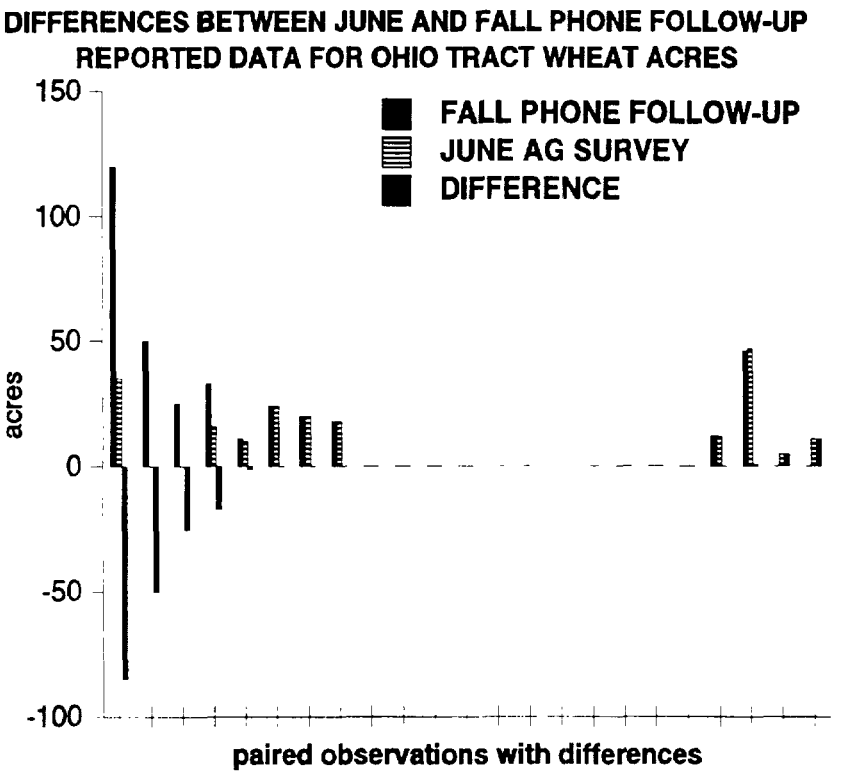

Figure 14

FALL FOLLOW-UP VS MARCH DIFFERENCES FOR ALL LAND IN TRACT OHIO

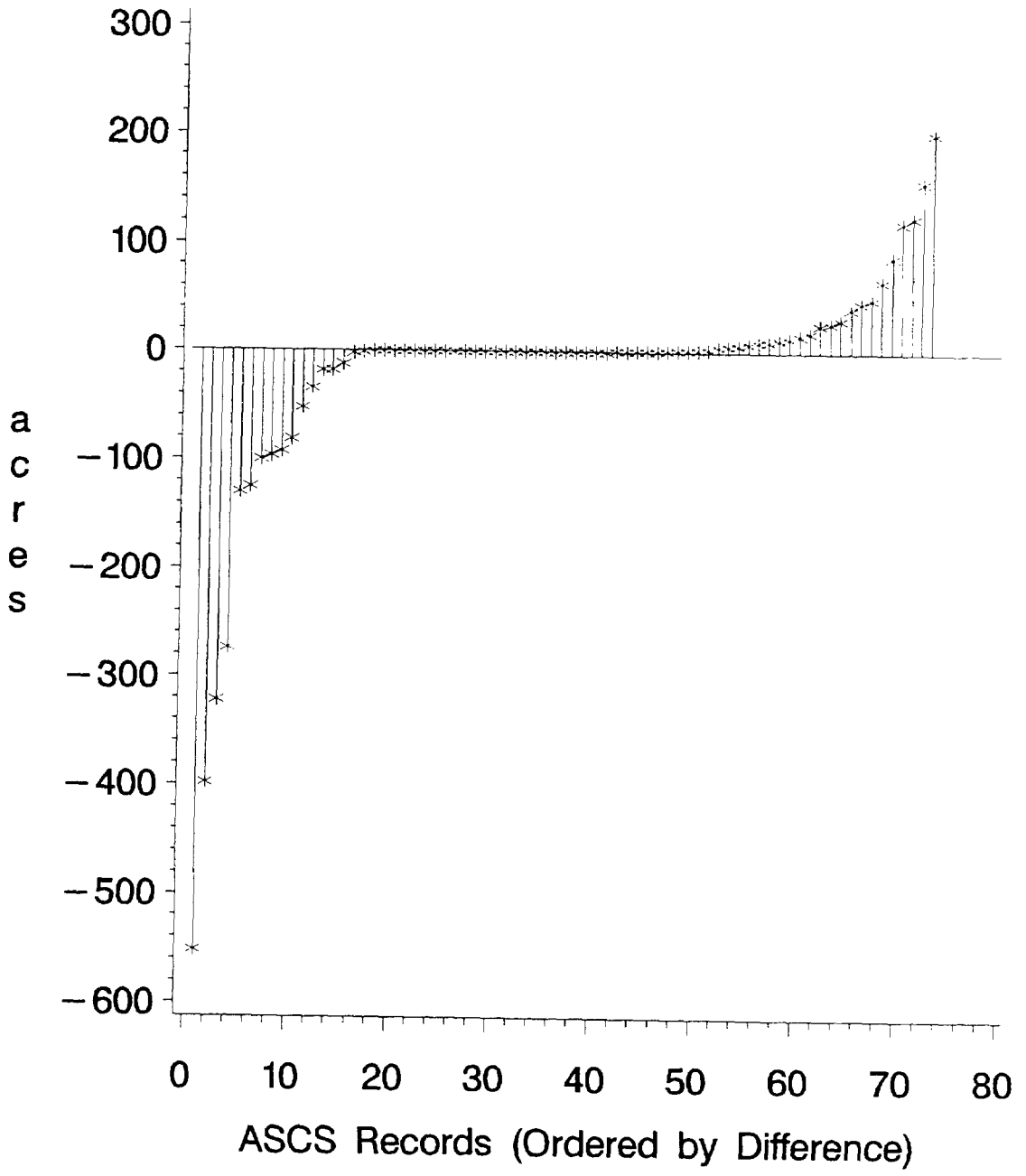

Figure 15

FALL FOLLOW – UP VS MARCH DIFFERENCES FOR CROPLAND IN TRACT

OHIO

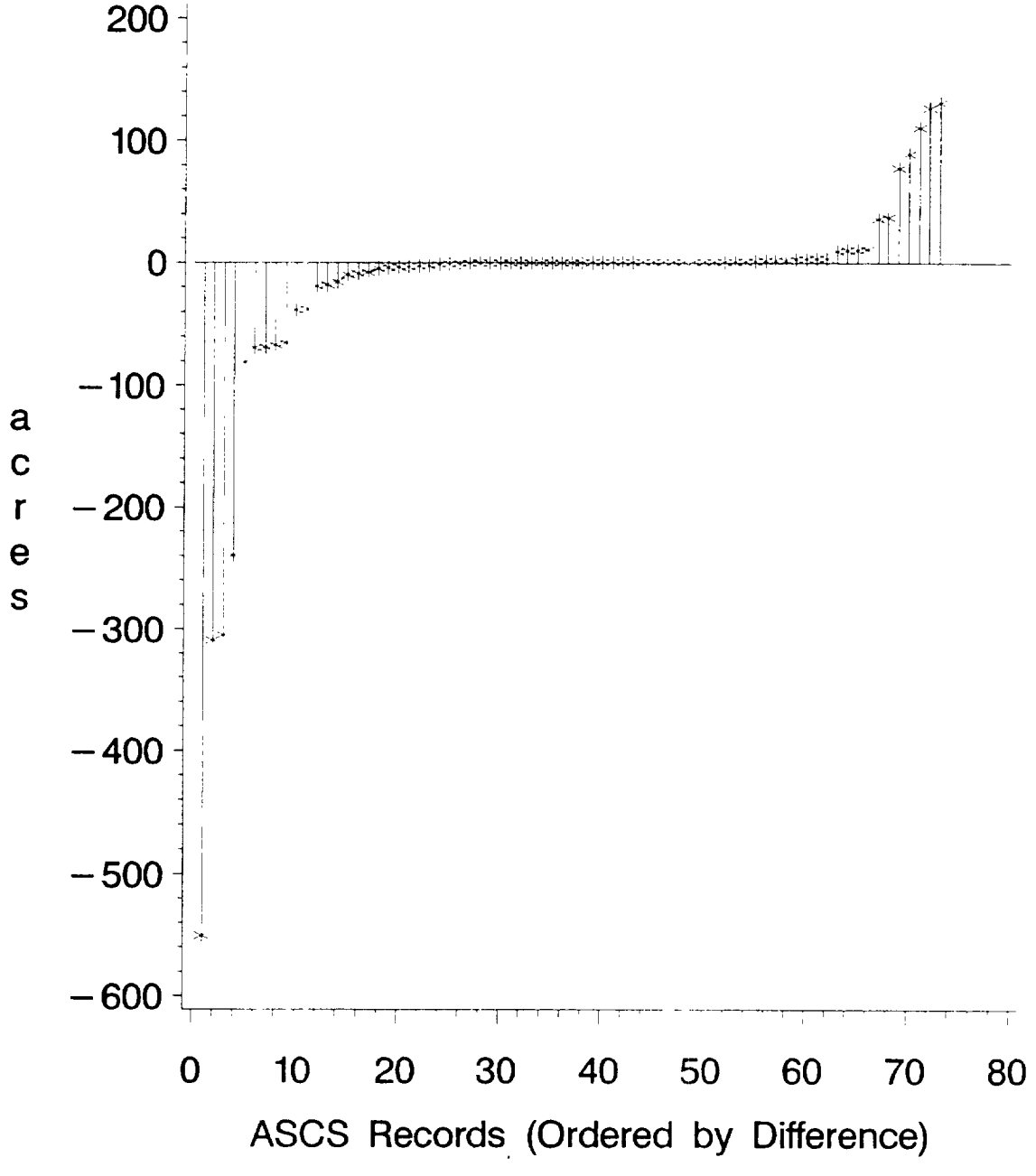

Figure 16

FALL FOLLOW-UP VS MARCH DIFFERENCES FOR ALL LAND IN TRACT
VIRGINIA

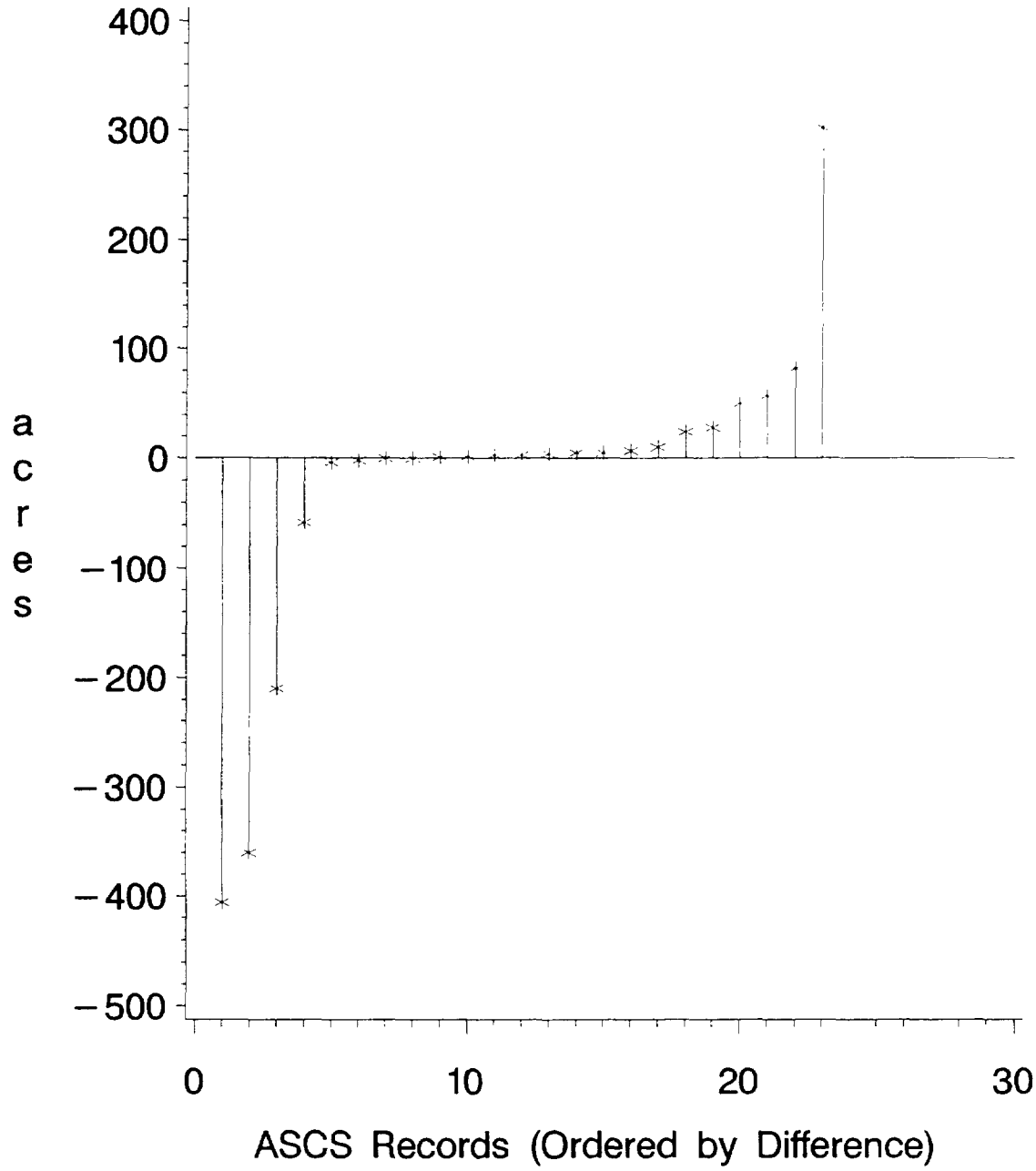

Figure 17

FALL FOLLOW – UP VS MARCH DIFFERENCES FOR CROPLAND IN TRACT
VIRGINIA

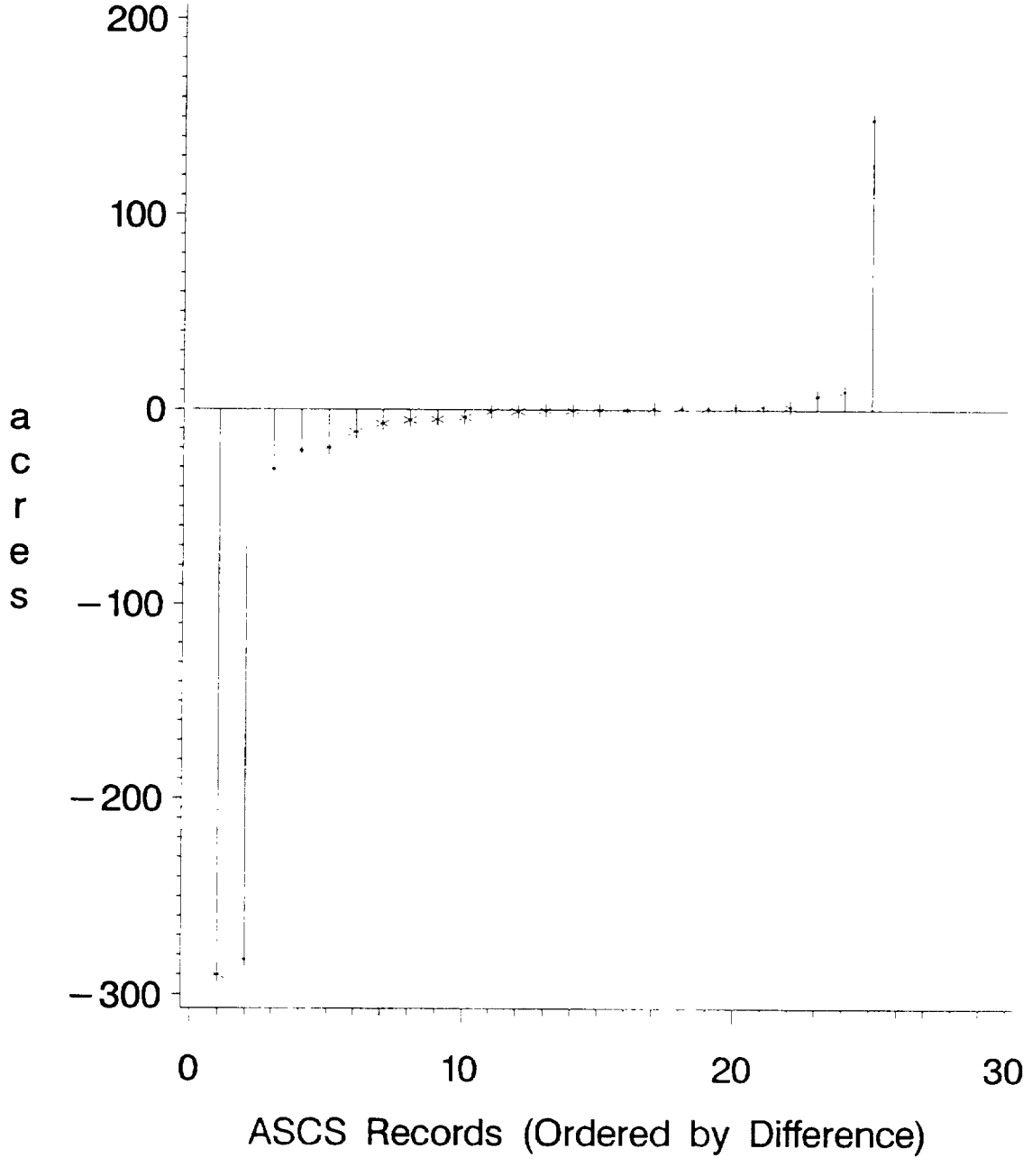

Figure 18

CONCLUSIONS AND RECOMMENDATIONS

Recommendation 1:
Perform more extensive and complete frame analysis using ASCS tract information available in the List Frame Section.

Recommendation 2:
Monitor the progress of INFOSHARE's computerized Geographic Information System and establish NASS as a potential data user.

Recommendation 3:
Endorse the procedure of obtaining "156-EZ" forms for use in pre-screening new segments, especially those located in isolated areas.

Of all the issues addressed in this study, that of frame coverage proved the most promising. Land in farm coverage of the ASCS list exceeded the coverage of the NASS list frame for every state. Although ASCS lists aren't complete, since some farmers may choose not to participate in the ASCS programs, the 99.7 percent coverage of total land in farm in Kansas is phenomenal. The high ASCS coverage percentages are attributable to the large sign up rate of farmers and the stability of the ASCS tract as a sampling unit. Even land currently used exclusively for pasture, but which was formerly in an ASCS program, still maintains the same tract identification number. In Wyoming, large tracts of grazing land were maintained on the list even though the operator in many cases did not have any crop acreage. So even though cattle is not in any ASCS program, the ASCS cattle coverage still exceeded that of the NASS LSF.

The biggest obstacle for using the ASCS list for livestock sampling is the lack of livestock control data. The resulting inability to stratify would have considerable impact on livestock estimation. For cattle operations, a stratification scheme could be modeled on hay and pasture control data, but hog operations have no such corresponding control data. Corn and soybean acreage does not necessarily correspond with number of hogs.

As a pre-screening tool, the names and addresses collected from the ASCS county offices were a definite asset for segments with few resident farm operators since the EZ forms provided a point of first contact, and, in a few cases, even phone numbers. Wyoming benefitted tremendously and intends to use this procedure next year. For Virginia, the benefits did not seem to justify the time and effort since most segments have a fair number of knowledgeable resident farm operators.

The quality of the control data attached to ASCS records was difficult to assess for several reasons. The definitions for the ASCS and June tracts were similar but not the same, so only those tracts with similar boundaries could be compared. ASCS control data attached to the farm ID was not necessarily complete farm information since a farmer could have a different farm ID in another county. NASS has recognized this possibility for a long time and resolves it by using an SSN or EIN as

the identifier to combine cross-county data to the farm level. The ASCS database being developed in the List Frame Section has the potential to provide a more thorough and pervasive analysis of ASCS control data quality at the farm level than was possible in this limited study.

In addition, because tract level identifiers have been kept and every ASCS tract is included in the database, tracts can be stratified based on size or other control data and expansion factors created. Prior to this year, tract level identifiers were not available from the data files NASS received from ASCS. In theory, this current ASCS database could be used in a similar fashion as NASS' list frame, using the ASCS tract ID as the sampling unit instead of the operator name. One possible research study would be to select a sample from the stratified ASCS tracts and conduct a survey similar in scope to NASS' June list survey. Because farmers were able to answer questions about their ASCS tracts over the phone, I recommend only the use of telephone enumeration.

One matter that did not enter into this study involved the possibility of tract level duplication. The ASCS database would be useful in determining the impact of this potential problem since sorting on ASCS tract ID would be possible. Records with the same tract ID, but different primary operators could then be identified and examined. However, true duplication resolution would require appraisal of the aerial flight line photos as well.

An issue addressed by this study with fairly positive results, was that of whether or not operators were willing and able to report accurate information over the phone based on their ASCS tract ID. Most Ohio farm operators seemed willing to give tract level data and most farmers gave information that did not differ too much from the information they gave in June. There were a few large differences but the use of ASCS tract data as an editing tool would reduce if not eliminate those large aberrations.

A technological development occurring at ASCS with large potential benefits for NASS is the conversion of its paper and photo method of tracking data to a computer database. ASCS is involved with several other USDA agencies in an initiative called INFOSHARE to develop a computerized Geographic Information System (GIS). The Soil Conservation Service appears to be the guiding force behind the development of this system since they have the most experience and expertise in the GIS environment.

The INFOSHARE group is now in the beginning phase of what appears to be a 3 or 4 year developmental process, and it would serve NASS well to designate a liaison to INFOSHARE, in addition to the NASS ASCS liason. This person should have a fundamental understanding of GIS, the NASS sampling frames (both list and area), and the associated sampling techniques. It is especially important for NASS to be aware of the Common Land Unit (CLU) that the INFORSHARE group will agree upon to be the building block for the GIS because this has the potential to be the NASS sampling unit if we were to use the GIS frame. This means different agencies may have specific attribute needs for their own geographic characteristics, but they will all be connected by a common geographic identifier with common attributes. At this point it ceases to be just an ASCS list but a more complete INFOSHARE frame representing not only ASCS, but also SCS, FCIC, FmHA, OIRM, and REA.

One potential benefit of an easily accessible GIS would be as a pre-screening tool. For new segments, NASS could identify names and addresses associated with the CLU using standard latitude and longitude points. CLUs falling within the new segments could be printed off as a geographic map with attribute data to be used in the field by the enumerator. For a follow-on survey they could be sent to the respondent as an aid in identifying an area sample unit.

Another potential benefit, and one that may have even more impact, involves using the GIS database as an aid in developing NASS' area frame. Because of the limitations of the aerial imagery NASS uses to stratify its area frame, land use is limited to agricultural and nonagricultural designations. INFOSHARE'S GIS has the promise of even more precise stratification since specific types of crops would be included in its attribute data.

Two ASCS field offices are in the process of implementing a computerized GIS--Rockingham County, Virginia and Osage County, Kansas. NASS could use their GIS files with the GIS software in the Research Division to explore the procedures necessary to make this tool useful on a practical level. If the commitment is made in developing a working relationship with this GIS program now during the early stage of its development, NASS will have a head start once INFOSHARE's GIS becomes fully operational.

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APPENDIX A:
1993 ASCS SCREENING FORM

STATE SEGMENT Part ____ of ____

_____ _____ County _____

Line No.	June Area Tract ID	ASCS Farm ID	ASCS TRACT ID	Does ASCS Tract Extend Outside Boundary Yes=1 No=2	Farm Acres	Tract Acres	Tract Cropland Acres
1	010	011	012	013	014	015	016
2	020	021	022	023	024	025	026
20	200	201	202	203	204	205	206

1a. Number of ASCS tracts drawn on photograph: _____
1b. Number of tracts listed on this sheet: _____

2a. Number of 156 EZ forms: _____
2b. Number of unique farm numbers listed on this page: _____

Enumerator:_____

APPENDIX B:
1993 ASCS/JUNE DATA COLLECTION FORM

STATE SEGMENT Part ____ of ____

_____ _____ County _____

Line No.	June Area Tract ID	ASCS Farm ID	ASCS TRACT ID	Area Match Indicator	Acres not covered by ASCS	Name Match Indicator	AG vs NON-AG
1	010	011	012	013	014	015	016
2	020	021	022	023	024	025	026
20	200	201	202	203	204	205	206

Number of out-of-scope ASCS tracts: _____

Amount of out-of-scope ASCS acres: _____

APPENDIX C:
METHODS USED TO DETERMINE NAME AND AREA MATCHES

ASCS and June tracts were considered area matches when:

$M = I*V*N = 1$

where

I = 0 if ASCS tract exceed segment boundary
1 if ASCS tract did not exceed segment boundary

V = 0 if ASCS and June tract boundaries did not seem reasonable matches
1 if ASCS and June tract boundaries appeared to agree

N = 0 if June non-ag contained within the borders of a June ag tract exceeded 10 percent of the total ag tract
1 if June non-ag tract was 10 percent or less of total June ag tract

Names associated with corresponding ASCS and June tracts were categorized given the following matches:

1 = June operator/ASCS operator match
2 = June operator/ASCS owner match
3 = June partner/ASCS operator match
4 = June partner/ASCS owner match
5 = no match

APPENDIX D:
COVERAGE FORMULAS

ASCS percent coverage for land in farms (LIF) is calculated as:

$$\begin{matrix} ASCS \\ LIF \\ COVERAGE\ \% \end{matrix} = \left[\frac{\sum_{i=1}^{n_n} \sum_{j=1}^{n_i} a_{ij}\ e_i}{\sum_{i=1}^{n_n} \sum_{j=1}^{n_i} y_{ij}\ e_i} \right] \times 100$$

where

y_{ij} = June ag tract acres for the j^{th} tract in the i^{th} segment,

a_{ij} = acres of a June ag tract covered by an ASCS tract, for the j^{th} tract in the i^{th} segment,

e_i = June area frame expansion for i^{th} segment,

n_i = number of tracts in the i^{th} segment,

n_n = number of newly rotated in segments in the state.

ASCS percent coverage for number of farms is calculated as:

$$\begin{matrix} ASCS \\ NUMBER\ OF\ FARMS \\ COVERAGE\ \% \end{matrix} = \left[\frac{\sum_{i=1}^{n_n} \sum_{j=1}^{n_i} f_{ij}\ e_i}{\sum_{i=1}^{n_n} \sum_{j=1}^{n_i} e_i} \right] \times 100$$

where

$f_{ij} = 1$ if $a_{ij} > 0$
$\quad\quad 0$ if $a_{ij} = 0$

and where the other variables are as previously defined.

ASCS percent coverage for hogs is calculated as:

$$\begin{matrix} ASCS \\ HOG \\ COVERAGE\ \% \end{matrix} = \left[\frac{\sum_{i=1}^{n_n} \sum_{j=1}^{n_i} \left(\frac{a_{ij}}{y_{ij}}\ h_{ij} \right) e_i}{\sum_{i=1}^{n_n} \sum_{j=1}^{n_i} h_{ij}\ e_i} \right] \times 100$$

where

h_{ij} = June tract all hogs for j^{th} tract of i^{th} segment,

and where the other variables are as previously defined.

APPENDIX D:
COVERAGE FORMULAS

NASS percent coverage for hogs is calculated as:

$$\begin{matrix} NASS \\ HOG \\ COVERAGE\ \% \end{matrix} = \left[\frac{\sum_{i=1}^{n_t} \sum_{j=1}^{n_i} h_{ij}\ o_{ij}\ e_i}{\sum_{i=1}^{n_t} \sum_{j=1}^{n_i} h_{ij}\ e_i} \right] \times 100$$

o_{ij} = 1 if j^{th} June ag tract in the i^{th} segment is overlap with NASS list frame
0 if not overlap

n_t = total number of segments in the state,

and where the other variables are as previously defined.

ASCS percent coverage for cattle for Kansas, Ohio, and Virginia calculated as:

$$\begin{matrix} ASCS \\ CATTLE \\ COVERAGE\% \end{matrix} = \left[\frac{\sum_{i=1}^{n_n} \sum_{j=1}^{n_i} r_{ij} (c_{ij} + (r1_{ij}\ c1_{ij}) + (r2_{ij} c2_{ij}))\ e_i}{\sum_{i=1}^{n_n} \sum_{j=1}^{n_i} (c_{ij} + (r1_{ij} c1_{ij}) + (r2_{ij} c2_{ij}))\ e_i} \right] \times 100$$

where

$r_{ij} = a_{ij}/y_{ij}$

$r1_{ij}$ = the ratio of field acreage within a segment to both field acreage inside the segment plus acres that June tract cattle have access to outside the segment,

$r2_{ij}$ = the ratio of a second field to total accessible acres both in and out of the tract,

c_{ij} = cattle with segment limited access,

$c1_{ij}$ = cattle in field 1 that also have access outside the segment,

$c2_{ij}$ = cattle in field 2 that also have access outside the segments,

and where the other variables are as previously defined.

APPENDIX D:
COVERAGE FORMULAS

The ASCS percent coverage for cattle for Wyoming is calculated as:

$$\begin{matrix} ASCS \\ WYOMING \\ CATTLE \\ COVERAGE\% \end{matrix} = \left[\frac{\sum_{i=1}^{n_n} \sum_{j=1}^{n_i} r_{ij} (c_{ij} + (r1_{ij}\ c1_{ij}) + (r2_{ij} c2_{ij}) + (rp_{ij} cp_{ij}))\, e_i}{\sum_{i=1}^{n_n} \sum_{j=1}^{n_i} (c_{ij} + (r1_{ij}\ c1_{ij}) + (r2_{ij} c2_{ij}) + (rp_{ij} cp_{ij}))\, e_i} \right] \times 100$$

where

rp_{ij} = tract to farm (less PIGA land) ratio for i^{th} tract in j^{th} segment,

cp_{ij} = cattle on PIGA land,

and where the other variables are as previously defined.

The formulas for NASS livestock percent coverage uses the o_{ij} indicator variable instead of r_{ij} ratio variable. The rest of the formula components are the same.

COEFFICIENT OF VARIATION

The ASCS Coefficient of Variation is calculated as:

$$C.V.\% = \left[\frac{stderr(\bar{x})}{\bar{x}} \right] \times 100$$

APPENDIX E:
FORMULA FOR DETERMINING ASCS OUT-OF-SCOPE ACREAGE

Out-of-scope acreage is defined as the non-ag acreage in June segments that is covered by ASCS tracts. It is calculated as:

$$\begin{matrix} OUT \\ OF\ SCOPE \\ ACREAGE\ \% \end{matrix} = \left[\frac{\sum_{i=1}^{n_n} non_i\ e_i}{\sum_{i=1}^{n_n} \sum_{j=1}^{n_i} a_{ij}\ e_i} \right] \times 100$$

where

non_i = Non-ag tract acres in the i^{th} June segment covered by the ASCS tracts located in the i^{th} segment,

and where the other variables are as previously defined.

APPENDIX F

1993
FALL FOLLOWUP SURVEY

Form Approved
O.M.B. # 0535-0140
Approval Expires 5/31/94

SCS TRACT ID	ASCS FARM ID	CONTACT#

ME AND ADDRESS

This is <enumerator name> with the VA/OH Agricultural Statistics Service and we want to find out if farmers can answer questions about the land they operate based on ASCS tract and farm identification numbers. The information you give will be confidential and as always your response is voluntary.

Do you make the day to day decisions for the land identified as ASCS tract id_____?

rec ck

___ Yes**<skip to 2>**
___ No**<continue>**
___ Don't know*

a) If no, what is the reason that you no longer operate this ASCS tract?

not opr

___ Renting tract to someone else.
<skip to b>
___ Sold tract.
<skip to b>
___ No longer renting tract from someone else.
<skip to b>
___ Out of business, no longer farmer, land non-agricultural.
(When did you stop farming?)* Date_____
___ Still farming but no longer participating in ASCS program.
(When did you stop participating?)* Date_____
___ Other*

b) What it the name and address of the person now operating this land?

NAME AND ADDRESS* _____

_____

c) When did the new operator take over? DATE _____

***This completes the survey and thank you for your help.**

At this time, I will only be asking questions about the ASCS tract.
perator may have to refer to ASCS records)
n ASCS tract ID_____

a) How many total tract acres are there? _____ ac

b) How many cropland acres are there? _____ ac

<if unable to answer, skip to 4>

3. Now I would like to ask you about the crops and livestock you have in ASCS tract ID _____.**<if unable to answer, skip to 4>**

CROPS	**PLANTED ACRES** (for 1993 harvest)
Corn	
Soybeans	
Winter Wheat	
Hay (harvested)	
LIVESTOCK	**NUMBER OF HEAD**
Cattle	
Hogs	

<skip to 5>

4. What would be the best way to get ASCS tract ID_____ information?

best way

___ Look at an ASCS photo
___ Talk to ASCS office
___ Call back later, so can have time to find ASCS records
___ Other

5. Now I would like to ask you questions related to your ASCS farm ID___

a) How many acres do you operate under the ASCS farm ID_____?

b) Is this the same as your total farm acres?
If not what is your total farm acres?

<ask 6 if any tract data given>

6. We're interested in the sources you used in answering questions for this ASCS tract. Did you

rec ck

a) Contact the ASCS office?
b) Use your home records?
c) Both
d) Other

This completes the survey and thank you for your help.

Respondent_____ Date_____

Enumerator_____

Did respondent use his or her ASCS records at any point during the interview?_____

APPENDIX G

October 13, 1993

Dear Ohio Farmer:

ASCS and the Ohio Agricultural Statistics Service (OASS) are conducting a joint research project in an effort to reduce the duplication of information gathering within the two agencies. The success of this project will not only reduce the cost of conducting surveys, it may also reduce the number of times a farmer has to be contacted.

In the past, when one of our telephone callers contacted you, they asked for information based on your entire farm, but this time when they call the second week in November, the questions will be based on an ASCS **TRACT ID** that you may operate. For your operation, we are interested in any crops and livestock you may have in ASCS tract_____, which is in farm_____.

If we can collect your ASCS tract information over the phone, it may be possible to use the ASCS list as a source for selecting our agricultural survey samples. Currently we have a separate list of farmers and the expense of maintaining this list could be reduced if this study determines that the ASCS list is just as good as the one we use for selecting samples.

As always your response is voluntary and any information you supply will be kept strictly confidential and combined with other reports so that individual records cannot be determined. Please note that we will <u>not</u> give ASCS any data from individual records.

Let me know if you have any questions.

Sincerely,

Deputy or State Statistician