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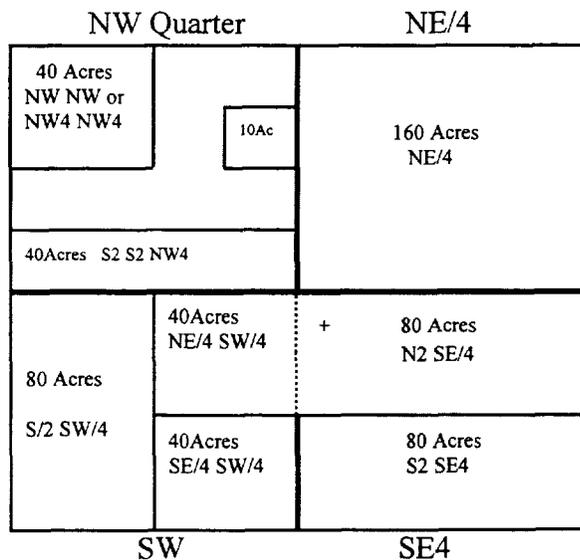
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# Use of FSA Tracts as a Sampling Frame for an Acreage Survey in Kansas

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**USE OF FSA TRACTS AS A SAMPLING FRAME FOR AN ACREAGE SURVEY IN KANSAS**, by Suzan M. Benz, Sampling and Estimation Research Section, Survey Research Branch, Research Division, National Agricultural Statistics Service, U.S. Department of Agriculture, Washington, D.C. 20250-2000, June 1996, Report No. SRB-96-01.

### **ABSTRACT**

The National Agricultural Statistics Service (NASS) maintains a list of farm operators to use as a sampling frame for its many agricultural surveys. The Farm Service Agency (FSA), formerly Agricultural Stabilization and Conservation Service, maintains a list of farm operators, and also lists of tracts and farms they operate in order to administer farm programs. While the FSA lists are for administrative and compliance purposes, they have potential to be used to develop a survey sampling frame for NASS. The features of FSA's list that make it an attractive alternative are: the electronic availability of files; the high level of coverage of major crops; the 'currentness' of the list; and the history of crop data available for the tracts.

This paper explores using an FSA list of tracts as a sampling frame to produce state level estimates for four major crops in Kansas. The project also explores the willingness and ability of farm operators to report acreage and production data via telephone for a specific FSA tract. The results of the study indicate that farmers can report data at the tract level by telephone. Only 1.6% of sampled operators were unable to recognize the specific tract requested. The data from this sample of FSA tracts produced viable state level estimates for four major crops using a much smaller sample size than NASS currently uses to produce estimates for these same crops.

### **KEYWORDS**

Sampling frame; Farm Service Agency; Area Frame; Acreage Estimates.

This paper was prepared for limited distribution to the research community outside the U.S. Department of Agriculture. The views expressed herein are not necessarily those of NASS or USDA.

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## SUMMARY

The National Agricultural Statistics Service (NASS) has been using data from the Farm Service Agency (FSA) since 1983 to update and build the NASS list frame (Anderson, 1993). Recent research has indicated that these same FSA data files could provide NASS with an alternate sampling frame (Weaver, 1994). A study was conducted in Kansas in November and December of 1995 to further investigate the feasibility of this approach. Kansas was the logical choice for the study because of their importance to winter wheat seedings estimates and their participation in the 1995 FSA Coverage Research Project (Parsons, 1996).

A sample of FSA tracts were surveyed with three specific objectives:

- ◆ Determine whether farm operators are able to report for a specific FSA tract via telephone.
- ◆ Produce survey estimates of four specific crops for use in setting NASS's published estimates.
- ◆ Identify potential problems in developing an FSA sampling frame and explore the feasibility of creating FSA sampling frames for a large number of states.

The data file, an 'ASCS-578 Farm Compliance Detail File - 1994', is a list of fields that have been certified with FSA for the 1994 crop year. These fields are part of an FSA tract, which alone or in combination with other tracts comprise an FSA farm. The FSA file was collapsed to the tract level for use as a sampling frame. The tracts were stratified and a systematic sample was taken within each strata. While this FSA file is not complete for crop acreage, work done during the 1995 FSA Coverage Research Project shows that levels of major crop acreage covered by FSA in Kansas are very high. To account for the small level of incompleteness, a small sample was selected from an 'area frame' of cropland areas suspected to be uncertified for the 1994 crop year. This area frame consisted of land that was in NASS's June Area Survey but not certified with FSA in 1994. This information was available from the FSA Coverage Project mentioned above.

A list sample of 925 tracts was selected from the FSA '578' file. The area frame sample included 43 pieces of land suspected to be uncertified in 1994. Names and addresses were attached to the selected list sample from an FSA name and address master. FSA does not require telephone numbers to be maintained for its records so only 42% of the tracts had telephone numbers. The sample was matched to NASS's list sampling frame (LSF) to increase the number of records with telephone numbers. This resulted in 87% of the records having telephone numbers attached to them. Handwork brought the number of tracts with telephone numbers to over 93%. Telephone numbers were found for most of the remaining tracts during data collection. Names, addresses and telephone numbers were already attached to the area sample.

To aid the farm operator in recognizing the selected FSA tract, each questionnaire had tract acres, tract owner and a legal description of the FSA tract preprinted on it. This information was obtained from enumerator visits to county FSA offices. In the future, these data should be available from FSA files.

Data collection began on November 13, 1995 and continued through the first week in December. A response rate of 80% was achieved, with only 1.6% of those contacted unable to recognize the FSA tract. Eight percent of those contacted refused to participate, while just under 11% of the tracts were inaccessible. The area sample was field enumerated, using maps to identify the selected land areas.

A state level estimate for 1996 winter wheat seedings was generated, as were acreage and production estimates for the 1995 corn, soybean and sorghum crops in Kansas. The sample stratification gave priority to the winter wheat seedings estimate and this estimate produced the lowest coefficient of variation (C.V.). The C.V. for the winter wheat estimate was 3.05%, corn 10.16%, soybeans 10.10% and sorghum 7.04%. The estimates produced from the research project compared favorably to similar estimates generated from NASS's December Agricultural Survey (DAS) and to those adopted by the Agricultural Statistics Board (ASB). While the coefficients of variation of the acreage estimates from the research project were higher than from the DAS, the sample size of the research project was approximately one third the size of a DAS sample in Kansas.

Farm operators were asked which of the four descriptors supplied (tract number, tract acres, tract owner, and legal description) were important in helping them to recognize the tract. The most important descriptor in Kansas was the legal description with almost 70% of those responding to the question indicating that the legal description, either alone or in combination with other descriptor(s), was important. The owner's name was important, either alone or in combination, to 58%, while 30% indicated acres were important, and only 20% thought the tract number was important. One third of the farmers that participated referred to some kind of report to help complete the questionnaire. Three questions were asked about how farmers can best report acreage and production questions. Most operators indicated that the easiest way for them to report data of this kind was by FSA farm, rather than by FSA tract, the sampling unit for this project, or their entire operation, NASS's usual sampling unit. FSA farm was also their choice when asked the most accurate way to report.

The first two goals of this project were well met. Operators were able to report crop information for a specific FSA tract via telephone. Usable state level estimates were generated for four major crops in Kansas. Valuable information was gained to aid in developing FSA frames for other states.

In April 1996, Congress passed the "Federal Agriculture Improvement and Reform Act of 1996". It is unclear at this time what administrative data FSA will collect in 1996 or future years. NASS needs to keep apprised of all developments surrounding this legislation. Once FSA has decided what data are needed to administer the new Farm Bill, the potential for using this information to develop a NASS sampling frame should be reevaluated.

## INTRODUCTION

In July 1992, the NASS Program Planning Committee requested that the Research Division evaluate the use of FSA lists of farms, tracts and fields to develop an alternative sampling frame. A small scale study done by the Tennessee State Statistical Office (SSO) showed promising results using FSA farm numbers as a sampling frame for a mail survey (Moore & Guinn, 1969). A second study in Tennessee showed coverage levels were high (Guinn, 1992). Since NASS currently receives data from FSA to use in updating its current list sampling frame, it seemed logical to explore other uses of the data. The FSA files contain data that could be used to form an alternative, effective sampling frame with low maintenance costs, high levels of coverage and current, high quality auxiliary data for each record. Given the recent changes within NASS's survey program and ever present budget concerns, an FSA frame could be useful to NASS's estimation program

Guinn suggested that FSA tracts be considered as a reporting unit. This idea has merit because FSA tract numbers change less often than FSA farm numbers due to FSA's definition of a tract and the rules established for changing tract numbers. Also, descriptors needed to aid in recognition of the reporting unit exist at the tract level and not at the farm level.

Reasons and possible benefits to using FSA tracts as a sampling frame include, but are not limited to: areas of land designated by tracts are clearly defined; tract numbers change less often than a NASS farm; administrative data from FSA are available

for use in nonresponse adjustments, exploring nonresponse biases, and as 'check data'; levels of coverage are higher than on NASS's current LSF for some commodities; an FSA frame is 'disposable', since it can be recreated from FSA files when needed; data are required for only part of an operation, possibly reducing burden or giving the operator more of a sense of confidentiality, and possibly allowing for more accurate data collection (Warren, 1990).

Using FSA as a sampling frame also has disadvantages. Listing the disadvantages allows for the development of reasonable expectations of how this frame could perform. Disadvantages include, but are not limited to: the small amount of telephone numbers available from FSA (only 42% of the 1994 Kansas tracts had a telephone number from FSA); lack of any information on livestock, thereby limiting the use of an FSA frame to a 'crops' type survey; large operators may be selected multiple times and may also have difficulty recognizing one specific tract. Possibly the biggest disadvantage at this time appears to be the uncertainty surrounding future farm programs (some of which are administered by FSA) and the future availability of data from FSA.

A study by Weaver (1994) explored issues dealing with both coverage levels and use of FSA as a sampling frame. The study showed that FSA land in farm coverage exceeded the NASS LSF land in farm coverage by between 5% and 23% in the states evaluated. Coverage of land in farms in Kansas exceeded 99%. A small follow-up study using FSA as a sampling frame showed that farm operators were able to

report acreage and livestock data for a specific FSA tract by telephone.

This study was designed to continue the investigation begun in Weaver's study by expanding the scope of the project and running it in as operational a mode as possible. It was also designed to address concerns about non-sampling errors in reported seeded (planted) acres of winter wheat when the data are for an entire operation, as in the NASS December Agricultural Survey.

The study was conducted in Kansas for several reasons. The first, as mentioned above, was due to concerns about winter wheat planted acreage reports for entire farms. Kansas is the number one producer of winter wheat and, as such, was a logical place to conduct the study. The other reasons were tied to the FSA Coverage project that was conducted in conjunction with the 1995 June Agricultural Survey in Kansas and Nebraska (Parsons, 1996). Data from this study provided an 'area frame' that covered the small amount of incompleteness in the Kansas FSA file. Familiarity with the many large Kansas data files available from FSA also came as a result of work on that study.

The goals of this study were:

1. Determine whether farm operators are able to report acreage and production data for a specific FSA tract by telephone;
2. Produce a state level estimate for 1996 Kansas winter wheat seedings, as well as acreage and production estimates for the 1995 corn,

sorghum and soybean crops.

3. Identify any potential problems in developing an FSA sampling frame and explore the feasibility of creating FSA frames for a large number of states.

The indications from the study were provided to the Kansas SSO for use in setting a winter wheat seedings estimate, as well as the year end estimates of 1995 corn, sorghum and soybeans. The data were also provided to the Crops Branch for use in setting national estimates.

## METHODOLOGY

FRAME DEVELOPMENT. Much of FSA's mission is the implementation and administration of farm programs. It maintains a list of farms and tracts for administrative and compliance purposes. Farm operators report to FSA several times during the crop year. The first report of interest to this study is the farm program sign-up, where farm operators sign contracts with the Commodity Credit Corporation (CCC) agreeing to abide by the rules of the current farm program. Farm operators may also report by filing an FSA Form 578. This form requires the operator to identify crops and acreage, by field, for an FSA farm, including non-program crops. This is commonly referred to as 'certifying' farm crop acreage and is done at the local (county) FSA office. All farm operators who are in farm programs must certify. Other farm operators certify to maintain their program crop acreage base and for crop insurance purposes.

An FSA farm is comprised of one to many

tracts. An FSA tract is defined as all contiguous land that is under one ownership and is operated as a farm or part of a farm (Common Farm and Program Provisions, 1992). A unique identification number is assigned to each FSA tract. Tract numbers are not supposed to change when the tract is sold unless the tract is split among multiple owners.

NASS currently uses FSA data to update and build the NASS list frame. One of the files that NASS receives from FSA is an ASCS-578 Farm Compliance Detail File (or '578' file). This file contains acreage and crop information for each field inside an FSA tract, as well as other data needed by FSA. The file does not contain information on livestock or grain stocks. A final '578' file for a specific crop year is generally available in the summer of the following year. The file used for this study was a 1994 '578' file, the most current 'final' file available.

According to Kish (1965) a frame is perfect if 'every element appears on the list separately, once, only once, and nothing else appears on the list'. While the FSA '578' file is far from being the 'perfect' frame, it does have many desirable characteristics and its flaws are not insurmountable. Kish goes on to mention four basic frame problems:

1. Missing elements units, noncoverage, incomplete frame;
2. Clusters of elements together in one sampling unit;
3. Blanks or foreign elements;
4. Duplication among sampling units.

The problem of missing elements or

coverage is relatively small, at least in Kansas, where coverage levels exceed 98% for program crops (corn, wheat, and sorghum). There is however, a form of clustering occurring in this list. FSA occasionally refers to a group of tracts as a multi-tract, and gives this group of tracts its own unique tract number. The multi-tract is labeled as such in FSA's files. Multi-tracts occurred on only 1,373 of the 209,080 tracts in the 1994 file (0.7 percent). Multi-tracts require special handling and are discussed from a data collection standpoint later in this paper.

There were no apparent 'blank' records at the tract level. The number of duplicate records appears to be minimal as well. There were only 283 duplicate tract records out of 209,080 tracts (0.1 percent). Duplicate numbers can occur when a tract changes operators during the crop year, but FSA needs to maintain the records for both operators because two certified crops have been grown in the same tract. Duplicate tracts can easily be identified, but need special handling.

The use of FSA tracts as a sampling unit required that the fields in the '578' file be collapsed down to an FSA tract level before sampling. The resulting file was a list of FSA tracts, by county, containing the different crops grown in the tract and their respective acreage.

The '578' file does not contain the information needed to contact the operators such as names, addresses, or telephone numbers; nor does it contain any descriptors to aid in recognition of the tract, such as total farmland, total cropland, names of owner(s) or a legal description of

the tract. This information was attached to the selected tracts as follows.

**NAMES, ADDRESSES & TELEPHONE NUMBERS:** The complex process of attaching names, addresses and telephone numbers was done by the Data Services Section. Since FSA does not maintain tract and farm numbers on its name and address master, three very large FSA files were needed to merge all the name, address and telephone information onto each tract. Fortunately, NASS already had these files for use in updating its list sampling frame. There were also some procedures in place to assist in the programming needed to attach the names, addresses and telephone numbers.

Unfortunately, the resulting file of names and addresses had telephone numbers on only 42% of the tracts. To increase this number the sample was matched to NASS's list frame, based on a Social Security Number (or Employer Identification Number). The matching resulted in all but 124 records having an NASS LSF identification number. Another 73 tracts were matched to NASS's LSF using manual lookup procedures, of which 70 tracts had usable telephone numbers. After all matching was done, only 64 tracts (7.0%) did not have a telephone number. A list of these tracts was sent to the Kansas office, where all but a handful of the telephone numbers were found. Use of a record linkage software, like AUTOMATCH, could help decrease the amount of time spent on manual lookups for future projects (Day, 1996).

**DESCRIPTORS:** One of the goals of this study was to determine if operators could

recognize a specific FSA tract when contacted by telephone. Therefore, one of the keys to this project was getting the tract operators to recognize which piece of land was selected for the study. Weaver's study indicates that some measure of tract acreage should be provided to the operators to prevent them from providing data at a different level, such as FSA farm or total farm acres. Use of owners names and legal descriptions were also deemed necessary as a result of Weaver's study and a pre-test of the questionnaire in Virginia.

The descriptors needed for tract identification should be available in computer files from FSA. However, for this study, the computer files containing three of the descriptors were not available due to computer tape problems at FSA headquarters in Kansas City. Kansas enumerators visited each local county FSA office to get a copy of an ASCS-156EZ 'Abbreviated 156 Farm Record', which contained all the needed descriptors. The information from these forms was keypunched by the Kansas SSO. This was a time consuming and costly process. For future projects, these data should be available electronically, saving both time and money.

To complete the frame and account for the small amount of land not covered by the FSA '578' file, a small sample was chosen from an area frame. The frame consisted of land that was in NASS's June Area Survey and **not** certified with FSA. This information was available from the FSA Coverage project conducted by Parsons in June and August of 1995. This project involved overlaying FSA tracts on top of NASS area segments, thereby getting a list

of cropland areas that were not certified by FSA. Since NASS's area frame provides complete coverage of Kansas, the non-certified areas in NASS's segments could be used to represent all non-certified cropland in Kansas.

The construction of the area frame required extensive work, including many telephone calls to the county FSA offices to verify information from the August portion of the FSA Coverage project. Since the FSA Coverage project identified 1995 certified and non-certified tracts in NASS June segments, and the FSA frame for this project was of 1994 certified tracts, extra work was done to match the 1994 list of certified tracts with the coverage data collected in 1995. The 1995 FSA tracts in NASS June segments were matched by county, farm number, and tract to the tracts in the 1994 FSA list of certified tracts. Those that matched were certified in 1994 and therefore not eligible to be sampled from the area frame. Those that did not match were carefully reviewed to determine if they were certified in 1994. After this review there were 77 land areas in the area frame potentially not-certified in 1994. These 77 land areas comprised the area frame for this study.

**SAMPLE DESIGN.** The sampling unit chosen was an FSA tract. The sample was stratified to minimize sample variance. Given that '578' files were available for Kansas for 1992 and 1993, alternative sample designs were analyzed by simulation using 1992 as the sampling frame and computing simulated estimates using data from corresponding tracts in the 1993 file (non-matches were assumed to be zero).

Sample size for the simulation was set at 1,000 FSA tracts. This was driven by three considerations: the amount of time Kansas had available to complete data collection (one to two weeks), amount of money available for the project, and an acceptable level of precision for the estimates.

The final sample design is in Table 1. A stratum for tracts with land only in the Conservation Reserve Program (CRP) was included. This was done because little actual farming occurs on these tracts and operators are more likely to be retired or non-farmers, thereby it might be more difficult for operators of tracts with just CRP to recognize the selected tract. Also, since the land is enrolled for a 10 year period during which time it is planted to permanent cover and may not be cropped, there was a small chance that any crops would be picked up in this stratum. The first land to come out of CRP should be in 1996. A separate stratum was also included for tracts in excess of 1,000 acres of cropland due to the potential effects these tracts could have on the survey indications.

Allocations between strata were attained using data from the matched tracts from 1992 and 1993. Estimates of variance and acreage were computed for each crop, by strata. A spreadsheet was used to observe the effects of different allocations between strata on the C.V.'s of each crop. The allocation chosen, although not providing the smallest C.V. possible for any of the four crops, does provide a compromise between crops. The projected C.V.'s are presented in Table 2.

**Table 1. Sample Design of FSA Tract Acreage Study**

Stratum	Description	Population	Sample	Expansion Factor
1	CRP only with < 1000 acres 'cropland' <sup>1/</sup>	13,986	25	559
2	.1 - 100 acres 'cropland' with no wheat indicator <sup>2/</sup>	33,419	100	334
3	100 - 400 acres 'cropland' with no wheat indicator	12,198	50	244
4	400 - 1000 acres 'cropland' with no wheat indicator	304	25	12
5	.1 - 100 acres 'cropland' with wheat indicator	56,503	100	565
6	100 - 200 acres 'cropland' with wheat indicator	62,719	275	228
7	200 - 400 acres 'cropland' with wheat indicator	23,171	200	116
8	400 - 1000 acres 'cropland' with wheat indicator	6,327	100	63
9	1000+ acres 'cropland'	453	50	9
NOL	Non-Overlap	-	43	
Total		209,080	968	

1/ 'cropland' is the sum of the certified acres in the tract.

2/ the wheat indicator is the sum of wheat, summer fallow, fallow in the tract

**Table 2. Projected C.V.'s**

Crop	Projected C.V.'s	1994 DAS C.V.'s	1995 June Area C.V.'s (Not Updated)
Wheat	2.7 - 3.4	2.7	3.2
Corn	8.6 - 9.5	5.6	10.5
Soybeans	8.8 - 9.5	5.6	7.9
Sorghum	6.4 - 7.0	4.2	6.9

A sample of 43 land areas were also chosen from the 77 land areas comprising the area frame of non-certified land. These 77 areas were split into two strata, based on expanded cropland in the land areas. Since these area samples were merely areas of land drawn off on a map and had no descriptors, they were field enumerated. The enumerators were provided with a map of the land area in question and also a

larger scale county map to aid in locating the small land area. A question on the area frame survey asked the operator if the land area was certified with FSA for the 1994 crop year. This was an additional attempt to determine if the land area was truly not certified in 1994 and was therefore non-overlap with the list sample frame of certified tracts.

THE QUESTIONNAIRE. The survey instrument and its design were extremely important to this project. In addition to providing the information needed to contact the selected operators by telephone, it needed to contain the descriptors to aid the operator in recognizing the specific FSA tract, and it also needed to contain the actual survey questions. Each questionnaire was printed individually, merging all the tract level information in the appropriate place on the questionnaire.

The list questionnaire (Appendix A) was organized into three sections: tract recognition, tract data, and cognitive information.

The section on tract recognition provided the tract descriptors, as well as confirmed that the name on the questionnaire still operated the tract. If the tract had changed hands, the names and address of the new operator(s) were requested, as was information on whether the tract had 'split' into more than one piece. The information on 'splitting' was used to determine whether data for the tract could still be collected. If the tract had split or was now being operated by more than one person, it would be difficult to collect data from the new operator(s) over the telephone because the original acreage and legal description were no longer useful. Tracts that 'split' were treated as inaccessible. Those tracts that did not split and were now being farmed by one new operator were enumerated by telephone when possible.

The section also asked how many tracts were operated. The question was asked to allow for comparison between number of tracts and ability to report data. It was

thought that operators with large numbers of tracts might have more difficulty reporting for one specific tract. This question was intended to be a relatively easy one for farmers to answer but it turned out to be extremely difficult to answer. It appears that while operators were able to recognize a specific tract, the concept of a tract had little meaning to them. Perhaps if we had asked how many FSA farms they operated we might have gotten more data. Shortly after the survey started, the enumerators asked that question last, instead of first. No summarization of this data was attempted due to the poor quality of the data and also due to the low number of tracts that were unrecognized by the operator (1.6%).

The questions collecting the tract data were of two kinds. The first asked the operator to confirm or correct the cropland acres in the tract that came from the 156EZ Forms. Acreage data were then collected for all four crops, with production data being collected just for the 1995 crops. The wording of the questions mimicked similar questions on the DAS. It was hoped that mimicking the DAS questions would minimize differences due to wording. A missing data code was available for use in all cells.

The last section contained questions about how respondents perceived the questions they were just asked. One of these cognitive questions dealt with which descriptors were the most important in aiding tract recognition, another asked if any records were used to complete the report. Data were also collected on the easiest and the most accurate way for operators to report data of this type. The

last question was an attempt to determine how operators arrive at acreage totals for a crop.

The area sample had a slightly different questionnaire (Appendix B). The first section was revamped to work in conjunction with an accompanying map. The data section was virtually the same as that on the list questionnaire. The cognitive questions were not asked, but two questions about certification for the 1994 and 1995 crop years were included. The question about 1994 certification was asked to determine if the chosen sample was truly not on the list of FSA certified tracts. Ten of the area samples were reported as certified with FSA, according to the operator, and their data were set to zero.

DATA COLLECTION ISSUES. Many important data collection issues have already been discussed, such as the low percentage of tracts with an FSA generated telephone number. This section of the paper will discuss other issues that have been mentioned but not discussed in detail, such as the collection of 156EZ forms from county FSA offices, multi-tracts, the occurrence of 'split' tracts, presurvey letters, multiple selections, and the use of legal descriptions. One important issue that also needs to be discussed is enumerator training.

**156EZ FORMS:** The gathering of these forms, while not a part of the original survey plans, nor recommended for future large scale surveys of this type, did provide valuable information about the FSA farms and tracts selected. The data on the 156EZ form are for an FSA farm and contains the operator's name and address as well as

acreage information for the farm. Each tract associated with that farm is listed individually as is the farmland, cropland, owner and legal description of the tract.

When the enumerators visited the county offices to collect the 156EZ forms for a given FSA farm and tract, four different things could have happened.

1. The 156EZ form was collected for the given farm and tract number. This happened for 817 tracts.
2. A 156EZ form was collected for the given tract, but the farm number had changed to a different farm number (79 tracts).
3. A 156EZ form may have been collected for the given farm number but the tract number had changed or was unknown (16 tracts).
4. No form was collected because both the FSA farm and tract numbers had changed (13 tracts).

These four categories were very useful for indicating whether a tract was still available for data collection. In categories 1 and 2, the tract numbers were still valid and a 156EZ form was obtained for the sampled tract. Therefore, these tracts had names, addresses, telephone numbers and descriptors. In general this indicated that the sampled unit was still in existence and available for data collection. Tracts in the last two categories had no 156EZ forms available for the selected tract. This meant that no descriptors were available, making data collection all but impossible. In general, this indicated that the sampled unit no longer existed and had either split or was no longer being certified with FSA. When no 156EZ form was available, enumerators were instructed to ask the

county offices what happened to the tract. Unfortunately no information was received on two-thirds of the tracts in categories 3 and 4. Most of these tracts ended up being coded as inaccessible.

If the descriptor variables were obtained electronically instead of from 156EZ forms, tracts would still fall into those same four categories. However, there would be no information on what happened to the tracts in the last two categories unless the county offices were contacted. Even if the county offices were contacted there could still be tracts where there was no information on what had happened to the tract. While this is a problem, careful questioning of the county offices might yield more information on these types of tracts. Of the tracts in the last two categories where the county offices had information on what had happened to the tract, many were multi-tracts or appeared to have 'split' since 1994.

**MULTI-TRACTS:** On rare occasions FSA assigns a multi-tract number to a group of tracts. One example would be using one multi-tract number to represent the 26 FSA tracts in a state park. Multi-tracts are labeled as such in the '578' file. The incidence of multi-tracts in the population is low. Only 1,373 of the 209,080 tracts in the 1994 file were multi-tracts (0.7%). The sample, with 10 multi-tracts, had a few more multi-tracts than might have been expected. Most of the multi-tracts fell in category 3 where the tract number changed but the farm number was still valid. However, only one tract was correctly identified as a multi-tract during the FSA county office visits. Without legal descriptions these tracts could not be

contacted by telephone. The possibility of obtaining the tract numbers that make up a multi-tract, either from the county office or an FSA file, needs to be further explored. Ultimately obtaining data for multi-tracts may prove to be difficult.

**SPLIT TRACTS:** After contacting the name on the label, three things were possible: the person operated the tract, didn't know if they operated the tract, or they did not operate the tract. The third case is where the possibility of a split tract can occur. When the person contacted no longer operated the selected tract, another question was asked to determine the disposition of the tract. Again there were three possible choices: the tract changed hands intact, the tract broke into several pieces or the disposition of the tract was unknown. When the tract broke into more than one piece, it was referred to as a 'split' tract. Tracts that split present problems because the descriptors for the different pieces of the split tract are unknown. A visit to a county office would be needed to get a map of how the tract was divided and new legal descriptions and tract operators before any attempt at contact could be made. This approach was not followed for this study because the number of split tracts was unknown. This approach would also add an unknown amount of cost to the project. Sixteen tracts indicated a split, 12 did not know if the tract had split and 22 indicated the tract had not split (cell 160 on the questionnaire was positive). Of the sixteen tracts that were coded as split tracts, 11 were in the last two categories from the 156EZ forms indicating prior to the survey that there was some type of change with the tract. In any type of operational setting, split tracts

would be difficult to handle without a high level of cooperation with the local FSA offices, given the tight time frame for most of NASS's surveys.

**PRESURVEY LETTERS:** A presurvey letter was sent to each tract operator a week before the survey began. The letter included the purpose of the survey as well as a list of the FSA tract(s) that would be asked about (Appendix C).

In order for a presurvey letter to be effective, the list of names and addresses must be usable. The quality of the names and addresses from the FSA Name & Address file varied considerably from having a complete and usable name, street address and city to a name and address that was all but useless because the city was given as 'unknown' or a primary name was given simply as 'JANET AND LONNIE'. Some tracts had a secondary name where the address should have been. In order to get as many of the presurvey letters delivered as possible, a program was run for those records that had matched NASS's LSF to determine which address, FSA's or NASS's, was better. FSA Address fields that did not actually contain address were fairly easy to identify since most began with 'C/O', '%', 'BY' or were blank. Substitution occurred for approximately 70 FSA addresses. Only 13 presurvey letters were returned as unusable. While there was no formal question asking about the presurvey letters, several questionnaires contained notes on farmers acknowledging the presurvey letter. Some of the telephone enumerators mentioned the letter during the telephone contact to help establish credibility with the tract operators.

**MULTIPLE SELECTIONS:** There were 18 occurrences of operators being selected more than once, involving 37 different tracts. Seventeen involved two tract selections and one "lucky" farmer had three of his tracts selected. Most matches were easy to identify using an FSA data variable (ASCSID) or by searching for duplications of county and FSA farm numbers in the sample. Seventeen of the 18 multiple selections were matched using the FSA variable. One match was discovered during the hand lookup procedures. While there were a small number of multiple selections in the sample, response rates were lower for this group: 65% complete, 22% refusal, and 14% inaccessible. The cause of the difference in response rates is unknown and speculation on why with so few samples would be amiss. In the future, response rates of the multiple selections should be carefully monitored. Special handling during enumeration should also be considered.

**LEGAL DESCRIPTIONS AND TRAINING:** Since one of the goals of this project was to gain recognition of the tract based on descriptors, it had to be possible to teach the telephone enumerators to use and understand the descriptors. NASS does not use any descriptors other than the name and address of the operation to aid in data collection. Some of the FSA descriptors were easy to understand and explain to the respondent, such as farmland acres in the tract and owner's name. However, NASS has not used, nor had it trained its telephone enumerators to use or read legal descriptions. In addition, the field containing the legal description is a text field and may contain data other than

the legal description. Teaching the enumerators to sift through the text to find the pertinent information required patience and practice. A manual was sent to the telephone enumerators before the training session. A significant amount of time at the training session was spent teaching the concepts behind the rectangular coordinate system, explaining how to understand the legal description, and also how to read it aloud to the tract operator. It took several completed interviews before the enumerators believed they, or the tract operator, could complete this survey by telephone.

## RESULTS

**RESPONSE RATES.** There was concern before the survey began that farm operators would not be able to report for a specific FSA tract. The response rates indicate that the incidence of nonrecognition was small. In only 1.6% of the tracts was the respondent unable to recognize the piece of

land that was being asked about. The survey response rates compare favorably with those from the DAS in Kansas. Table 3 contains response rates from the FSA project by strata, as well as response rates for the Kansas DAS. Remember that the inaccessible rate for the research project includes tracts that had 'split' since 1994. No further data collection efforts were made for these tracts.

**ACREAGE ESTIMATES.** Estimates were produced for 1996 winter wheat seedings, as well as planted and harvested acres, yields and harvested to planted ratios for 1995 corn, soybeans and sorghum. The list acreage estimates were produced by a direct expansion of the data, which was reweighted to account for non-response for each item. The area estimates followed similar formula for land stratum. See Appendix D for a more detailed discussion of list estimates. Formula for all estimates came from Kott (1990).

Table 3. FSA & DAS Response Rates

Strata	Response Code				Total
	Telephone	Refusal	Inaccessible	Tract Unknown	
1	21	1	3	0	25
2	81	5	10	4	100
3	39	5	5	1	50
4	21	1	3	0	25
5	81	7	11	1	100
6	222	25	27	1	275
7	164	18	16	2	200
8	74	7	14	5	100
9	32	7	10	1	50
FSA Tracts	735	76	99	15	925
FSA %	79.5	8.2	10.7	1.6	
DAS %	75.0	14.3	10.7	NA	

Table 4 contains the estimate for the 1996 winter wheat crop, as well as the DAS indication and the official final NASS published estimate from the Agricultural Statistics Board (ASB). Also included are estimates for the 1995 corn, soybean and sorghum crops. Estimates of planted acres, harvested acres, harvested/planted ratio and yield are included, as are the corresponding DAS and ASB estimates. Appendix E contains strata level expansions and counts for wheat, corn, soybeans and sorghum.

If the ASB number is used as 'truth' or as a benchmark for measuring other estimates, then the estimates produced from the research study were quite good. The winter wheat seedings estimate provided by this FSA frame was within one standard

error of the ASB estimate of wheat seedings. The acreage estimates for the 1995 crops were within two standard errors of the final ASB estimates for all items. Overall, the estimates for seeded and planted acres were within 3.5 to 12.1 percent of the ASB estimate for all the crops estimated. Similar estimates from the DAS were within 2.5 to 17 percent of the ASB planted and seeded numbers.

The survey did not perform as well in the case of harvested to planted (H/P) ratios. The H/P ratios for soybeans and sorghum were within two standard errors of the ASB, however the corn H/P ratio was well off the ASB. This may in part be due to the questionnaire not asking separate questions for silage and other uses of the crop, as is

**Table 4. FSA Tract Acreage Estimates, DAS Indications & ASB Crop Estimates**

Wheat	FSA Tract Acreage		December Ag.		Board
	Estimate	C.V.	Estimate	C.V.	
Seeded	11,509	3.05	11,624	2.76	11,800
Corn	FSA Tract Acreage		December Ag.		Board
	Estimate	C.V.	Estimate	C.V.	
Planted	2,220	10.16	2,016	5.95	2,150
Harvested	2,166	10.35	1,923	6.19	1,970
Harvested/Planted	0.984	0.73	0.953		0.920
Yield	124.1	4.31	123.8	2.50	124.0
Soybeans	FSA Tract Acreage		December Ag.		Board
	Estimate	C.V.	Estimate	C.V.	
Planted	1,846	10.10	2,458	6.88	2,100
Harvested	1,777	10.36	2,430	6.79	2,050
Harvested/Planted	0.988	0.87	0.989		0.976
Yield	26.2	6.41	25.7	3.11	25.0
Sorghum	FSA Tract Acreage		December Ag.		Board
	Estimate	C.V.	Estimate	C.V.	
Planted	2,965	7.04	3,428	4.03	3,300
Harvested	2,807	7.65	3,224	4.56	3,100
Harvested/Planted	0.950	2.09	0.937		0.939
Yield	54.9	3.29	55.9	2.50	56.0

done on DAS. The survey did perform extremely well in estimating yields for corn, soybeans and sorghum. All yields were within approximately 1.5 bushels of the final ASB estimate.

The estimates from the FSA sample were provided to the Kansas State Statistical Office for their use in setting a preliminary winter wheat seeding estimate (1996 crop) and also in setting final estimates for 1995 corn, soybeans, and sorghum. The data were also provided to the Crops Branch for use in setting the final ASB estimates.

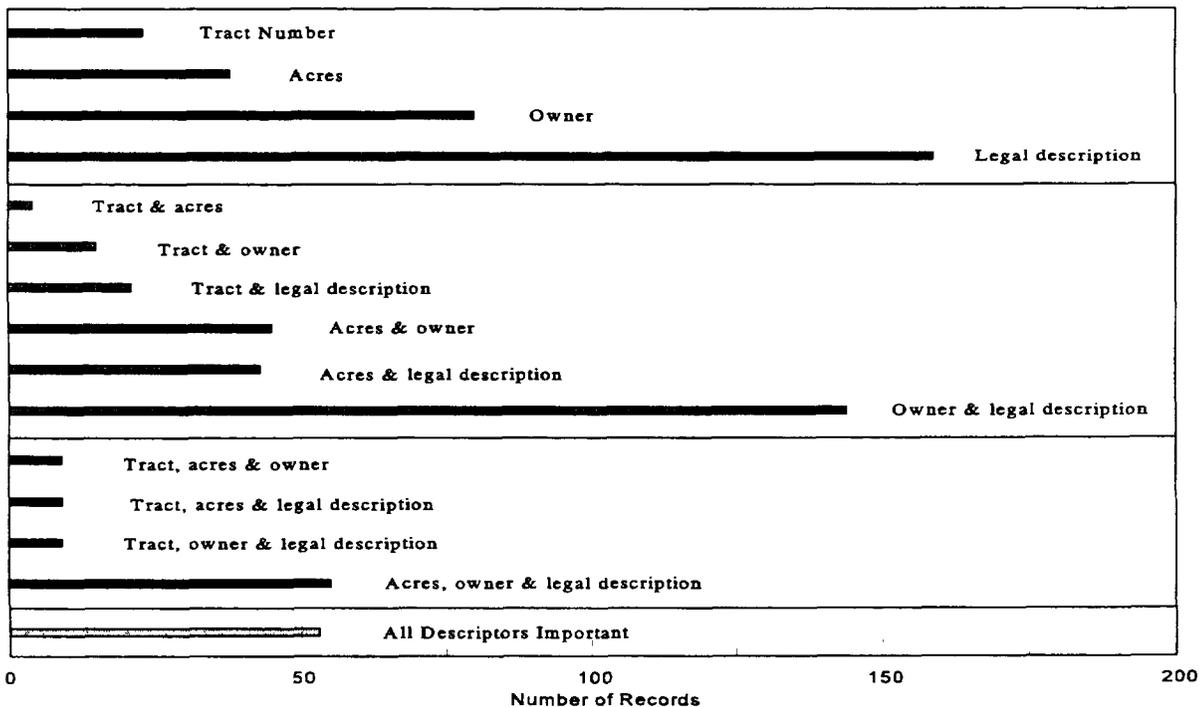
It should be re-emphasized that sample sizes for the FSA study were one third that of the DAS. Given the current trend of budget cuts and changes to NASS Agricultural Survey program, FSA appears to provide a viable alternative for crops surveys at a potentially lower cost. The lack of livestock control data may make this frame unsuitable for non-crop type

surveys.

**COGNITIVE DATA.** There were five questions included on the survey instrument to gather data on respondent's perceptions of the survey questions. These cognitive questions dealt with two different areas: facts about reporting and opinions on reporting. The facts centered around what information was used to respond to the questionnaire, such as which descriptors were important and if any outside information was used. The opinions focused on how the operators felt they could best provide information of this type. It was hoped this would lead to information that would be helpful in conducting future surveys of this type.

**DESCRIPTORS:** Figure 1 shows how many and what combination of descriptors were important in tract recognition. One or two descriptors were used by the majority of those responding to the

**Figure 1. Number of Records Identifying Important Tract Descriptors**



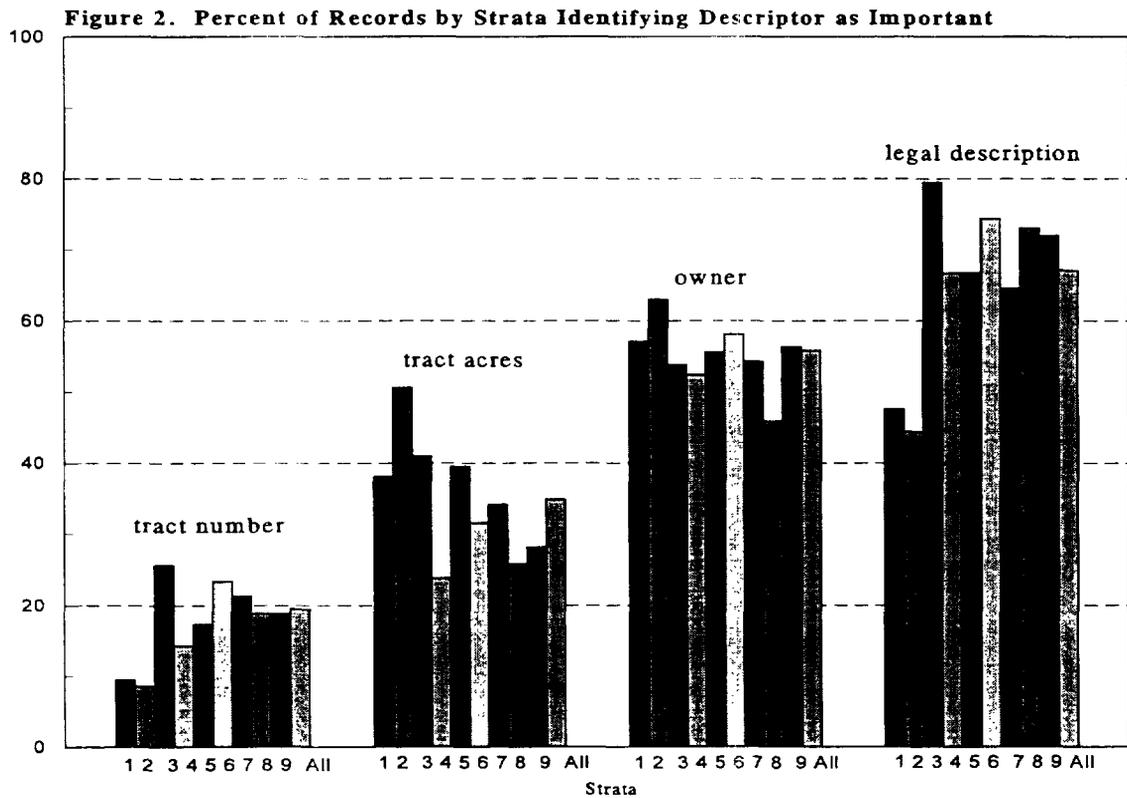
question, and the descriptor(s) that were the most important were legal description (important to 70%) and owner's name (important to 58%).

Figure 2 shows the same data summarized at the strata level. There would appear to be little effect at the strata level with the exception that tract number seems to be slightly more important to larger tracts. The CRP and small non-wheat tracts seemed to find tract acres more important and legal descriptions less important.

The data indicates that all of the descriptors provided to the Kansas farmers were important for recognition and should be included (if available) in future projects. We expect that the familiarity or use of legal descriptions will vary by state and geographic region. Farmers in Kansas

were familiar with legal descriptions. However, farmer familiarity with legal descriptions in an Eastern state, like Virginia, is expected to be quite a bit less. The content of the FSA data field containing the legal description also varies by state and even by county, with some containing a legal description and others just a map number. If available, legal descriptions could be a valuable tool in aiding tract recognition in many states, particularly those using the rectangular coordinate system. In states that use the system of metes and bounds, a legal description is all but useless to the farmer. However, a small scale telephone survey was conducted, in both Virginia and Ohio, without a legal description.

One choice that was not included in this question, and should have been, was 'FSA



Farm'. It became apparent as the survey progressed that an FSA farm had more meaning to farm operators in Kansas than the FSA tract. Over sixty of the questionnaires had 'FSA Farm number' handwritten by this question.

**RECORDS:** Just over one third of the respondents used some type of record(s) to assist in reporting the data. Thirteen percent used at least some type of FSA report, 17% used at least an FSA photocopy of the tract and 15% used some other type of records. The most common 'other type' of record included measurement service reports and the operator's own maps and records. The presurvey letter caused some operators to look up the tract information before the telephone call occurred. Table 5 contains a summary of the data from this question.

**Table 5. Record Usage**

Did you refer to any of the following to report .....	Percent of Respondents
Any type of FSA Report	13.2
FSA Photocopy of Tract	17.0
Other Records	15.2
Used any type of Records	36.3

**DATA REPORTING:** Two other questions dealt with the farm operator's feelings on the 'easiest' and also the most 'accurate' way to report acreage data of this type. Farm operators felt that the easiest way to report data was also the most accurate way to report acreage data. Given the choice of FSA tract, FSA farm, or entire operation as the 'easiest/most accurate' method to report, FSA farm was the choice of the majority of those

responding to both questions (51% easiest, 48% most accurate). FSA tract was the second choice for both questions (27% easiest, 34% most accurate). NASS's major method of data collection, for an entire operation, came in third (22% easiest, 19% most accurate). Table 6 contains more information on this question.

**Table 6. Easiest & Most Accurate Way to Report**

By:	Easiest way to Report N (%)	Most Accurate way to Report N (%)
FSA Tract	181 (27.1)	224 (33.5)
FSA Farm	343 (51.3)	318 (47.6)
Entire Operation	144 (21.6)	126 (18.9)

Data at the strata level followed that at the state level with some exceptions. For the two strata with 400 to 1000 acres of 'cropland', both with and without the wheat indicator, the difference between those choosing FSA farm and FSA tract was much smaller than at the state level. This might indicate that the differences for reporting for FSA farms or FSA tracts diminish for larger farms, except that data for stratum 9 (1000 acres and up) followed the state trend. Another difference was in the 400-1000 acres/no wheat indicator stratum. Those operators reported it would be more accurate to report for an FSA tract. This was the only stratum to choose FSA tract over FSA farm. However, this stratum had a relatively small number of samples selected from it. The last difference was in the 'easiest' question.

Strata 1, 2, and 7 had the entire operation as the second choice, over FSA tract. This did not occur for the 'accurate' question.

One final question shifted the focus off of the tract and onto the entire farming operation. The intent of the question was to determine how farmers come up with acreage totals for a specific crop for their entire operation. The question provided three choices as well as two options for open-ended answers. Two of the given choices were selected most often by farmers, with 'adding up acres in individual fields' (50%) being chosen more often than 'knowing the total acres without doing any type of calculations' (31%). The strata level data followed the same pattern with one exception. For the smallest acreage stratum with no wheat indicator (stratum 2) 'knowing the acres' was chosen at a higher percent than 'adding up fields'. One might think that if farmers were really adding up fields to arrive at totals, that reporting at an FSA tract level (the closest to fields) would be easiest and/or most accurate. This however was not the case. The answers to this question could well be biased by the choices given or more by the choices left out, like FSA farm. These results could also vary depending on the time of year it was asked. Table 7 contains the results of this question.

**SURVEY INFORMATION.** There were also four questions for the telephone enumerators to answer after the interview was over to help gauge how accurate the names and telephone numbers were, as well as information on number of call attempts and interview length. There was also information gathered on who responded to

**Table 7. Response to Knowing Total Acres**

If asked for the total acres of a crop in your operation, would you.....	Number	Percent
Know total acres	215	30.7
Add up acres in fields	353	50.4
Add up acres in FSA tracts	60	8.6
Add up acres another way	41	5.9
Other method	32	4.6

the survey. Over 85% of the contacts were made to the farm operator. The survey information data are presented in Table 8.

**Table 8. Summary of Survey Information**

Percent of Questionnaires with:	
Usable Telephone Numbers .....	88%
Usable Names on label .....	94%
Respondent:	
Operator.....	86%
Spouse.....	3%
Other.....	3%
Blank (not coded for inaccessibles)..	8%
Average Number of Call Attempts.....	2.9
Average Interview Length (minutes).....	5.0

## CONCLUSIONS

As NASS continues to search for ways to improve survey estimates during times of declining budgets, new methods are being explored and applied in many NASS survey programs. The use of FSA data as a sampling frame is another effort to improve survey methodology while holding the line on cost.

The results of this research project were very encouraging. Care should be taken however in trying to extrapolate these

results to any state other than Kansas. Further research is needed to determine if these same results would be seen in other states where coverage levels are not as high or familiarity with legal descriptions is lower.

**Farmers can report data for specific FSA tracts.** The concerns about FSA tract recognition turned out to be unfounded, as only 1.6% of the Kansas farmers contacted were unable to recognize the tract.

An interesting result from the survey was that farm operators thought reporting data on FSA tracts, or even FSA farms, was easier and more accurate than reporting for their entire operation. Since NASS collects most of its data for an entire operation, this area may need additional research.

**Viable estimates were produced for winter wheat seedings as well as for acreage and production of corn, soybeans and sorghum.** Results from this study were provided to the Kansas SSO and the Agricultural Statistics Board. C.V.'s for this project were higher than those achieved in the DAS, however **sample sizes were one third that of a typical DAS.** The winter wheat seedings estimate was very good, with a C.V. of only 3.05%. Estimates for planted acreage of corn, soybeans, and sorghum had C.V.'s ranging from 7 to 10%. Yields for all crops were within 1.5 bushels of ASB estimate.

The third goal was to explore the feasibility of developing an FSA frame for operational use. **While it is hard to imagine the problems that could occur in another state or group of states, the problems that did occur for this project were not**

**insurmountable.** The lack of telephone numbers on FSA records was handled by matching to the LSF, as well as some handwork. While this method might prove cumbersome for a large number of states, the use of record linkage software might limit handwork significantly. The majority of the data used for this project came from FSA files, so expanding to other states would require more computer time and disk space. Assuming the scope of the project did not change, the programs used to select the sample, merge sample descriptors onto the questionnaires and presurvey letters, as well as the edit and summary system could all be adapted for use in other states. The ability of farm operators to respond based on an FSA tract, as well as the availability of data from FSA, are issues that need to be further explored.

The sampling unit should remain an FSA tract despite the fact that farm operators felt it was 'easiest' and 'most accurate' to report data of this type for an FSA farm. The two main reasons not to change the sampling unit remain: the stability of the FSA tract, and the availability of descriptors only at the tract level.

While an FSA frame appears to be a viable alternative in generating crop estimates, it does not have as much application for livestock or grain stocks estimates. The current list frame or other alternative frames will be needed for these items.

## RECOMMENDATIONS

The results of the study, while very promising, have raised some interesting questions that form the basis of the following recommendations.

**1. NASS SHOULD MONITOR CHANGES OCCURRING DUE TO THE NEW FARM BILL, AND CONTINUE TO SEARCH FOR ALTERNATE SOURCES OF DATA.**

As the new Farm Bill is implemented in 1996, and beyond, NASS staff should observe and evaluate the data available for the agricultural statistics program. While the new Farm Bill is in effect for the next seven years, it will be important to monitor changes that occur in the coming years. This is particularly true in light of President Clinton's remarks at the signing of the Farm Bill where he said "I am signing H.R. 2854 with reservation because I believe the bill fails to provide an adequate safety net for family farmers." He goes on to say "I am firmly committed to submitting legislation and working with Congress next year to strengthen the farm safety net." Any changes made to the Farm Bill in 1997 or beyond would have impacts on the level of data available from FSA.

NASS should also look at potential data sources from agencies other than FSA, such as the National Resources Conservation Service, formerly the Soil Conservation Service. NASS also needs to keep abreast of development in the recently streamlined Info Share program within USDA.

**2. IF THE DATA NECESSARY TO CONSTRUCT AN FSA FRAME ARE AVAILABLE, IN 1996 OR FUTURE YEARS, THE FOLLOWING SHOULD BE CONSIDERED:**

**2A. CONDUCT ANOTHER FSA TRACT WHEAT ACREAGE SURVEY IN KANSAS.**

The survey should be conducted again in Kansas to test the reliability and repeatability of the results. The original survey was conducted at just one point in time and space. For estimates of this type to be truly valuable, there needs to be a series of data available, not just a single point on a graph.

**2B. EXPAND THE SURVEY TO SEVERAL OTHER STATES.**

The original survey was conducted in one Midwestern state where coverage levels of crops by FSA was very high. The geography and farming methods of Kansas are such that the legal descriptions of the tracts have meaning to farm operators. While these procedures may not work as well, or at all in states with low FSA coverage and/or no usable legal description, it did work well in Kansas. Our recommendations for additional states for a second survey of this type will concentrate on those states that will provide NASS with usable estimates.

Since our original focus was on winter wheat, and the results were particularly promising for that crop, we propose adding three states that would keep the focus on winter wheat yet allow us to collect data on other crops of interest to the selected states and the Crops Branch.

The additional states currently under consideration are Oklahoma, the second largest winter wheat state after Kansas; Nebraska, a top ten winter wheat state, as

well as a major producer of corn, soybeans and sorghum; and Indiana, a state located outside the 'wheat belt' that is still a minor producer of wheat, but a major producer of corn and soybeans.

In addition the expansion to other states will allow us to evaluate the process of creating FSA frames for each state and generating the needed acreage and production estimates under 'real time' conditions.

This type of approach would still need to be evaluated in areas where coverage is not high and in areas where legal descriptions of FSA tracts are either not available or less important to farm operators.

**2C. DO NOT CONDUCT THE AREA FRAME PORTION OF THE SURVEY IN STATES WHERE COVERAGE IS HIGH.**

The frame constructed from the FSA '578' file was incomplete. Data from the FSA Coverage Research project could allow us to 'complete' the frame in two different ways. The method used for this project was to construct an 'area frame' of tracts and select a sample of those that were not certified in 1994. An alternate method would be to use the estimates of FSA coverage levels for specific crops that were generated as a result of the FSA Coverage project to expand the list estimates from this project. The final results of the FSA Coverage project were not available in December for use in this project, but should be available if these projects are conducted again.

When levels of coverage are high, the

second method would be best from a cost/benefit standpoint. Since the cost of conducting the area survey is high and the amount of data coming from the area frame is small, costs could quickly outweigh benefits. This was probably the case in Kansas in 1995 where less than 100,000 acres out of the estimate of 11.5 million acres of winter wheat came from the area frame. Because this was the first survey of this type, we felt it was better to use an area frame and evaluate its worth after the project. Another problem with the area frame was the time it took to develop it. Producing area frames for states new to the Coverage Research project (Oklahoma and Indiana), selecting samples and then collecting data for all four states may not be cost-effective.

If the FSA coverage is 'high', we propose expanding the list expansion with the 'coverage adjustment factor' estimated from the FSA Coverage Research project (See Parsons, 1996 for more details). For example, the coverage adjustment factor for certified winter wheat acres was 1.0108. Multiplying the 1996 winter wheat seedings list expansion from this study of 11,401,000 acres by 1.0108 would give 11,534,000 acres as the total winter wheat seedings in Kansas for 1996. This compares closely to our total survey estimate of 11,509,000 acres of wheat seeded.

**2D. CONDUCT THE SURVEY USING BLAISE INSTEAD OF PAPER QUESTIONNAIRES.**

A research project was conducted in April 1996 using a subsample of the FSA Tract Acreage study using Blaise instead of a

paper questionnaire. The purpose of this study was to evaluate the levels of reporting consistency for winter wheat planted acres using the FSA frame. The levels of differences could be compared to levels of differences of whole farm data from NASS's December and March Agricultural Surveys (Hood, 1996).

Blaise is a computer assisted telephone interviewing package developed in the Netherlands and is used by NASS to conduct the quarterly Agricultural Surveys, as well as other surveys such as Cattle on Feed in many states. If the use of Blaise is successful in Kansas in April, it is recommended for use in states familiar with it. Oklahoma, Nebraska and Indiana are familiar with Blaise. Use of the Blaise instrument would eliminate the time-consuming process of printing questionnaires containing FSA tract identification information. It would also eliminate most hand editing and coding, almost all data entry tasks, and the need for a LXES edit. Blaise also allows for more intricate data checks or historical data checks.

2E. THE NASS SURVEY DESIGN 2000 TEAM SHOULD CONSIDER AN FSA SAMPLING FRAME AS A POTENTIAL ALTERNATIVE IN THEIR PLANNING.

One of the options proposed by the Area Frame Action Team of the Survey Design 2000 committee to improve the efficiency of NASS's survey program is to use an FSA frame for conducting an end of year survey to provide estimates of winter wheat seedings and harvested acreage and production of fall harvested crops. This

study supports that option as a viable alternative, pending the impact of the 1996 Farm Bill. The Sampling and Estimation Research Section will work closely with the Area Frame Action Team to ensure that any outstanding issues or concerns are addressed in the next study.

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# Appendix A - List Questionnaire



**NATIONAL AGRICULTURAL STATISTICS SERVICE**  
 U.S. Department of Agriculture  
 Rm 5809, South Building  
 Washington, D.C. 20250  
 202-720-7017

## FARM SERVICE AGENCY TRACT ACREAGE REPORT

Form Approved  
 O.M.B. Number 05  
 Approval Expires 6  
 Project Code 520

This is (*enumerator name*) with the Kansas Ag Statistics Service. We are interested in obtaining data for Service Agency (formerly ASCS) tract that you operate contacting you because the 1995 data are not yet available all tracts, and the 1996 data have not yet been reported information you give will be kept confidential and returned voluntarily.

1. How many FSA tracts do you operate? ..... **Number** 150

2. Do you operate, or can you report data for, FSA Tract XXXX, which is part of Farm Number XXX?  
 FSA records show that this tract has XXX.X total acres and was certified in CCCC county.  
 They also show that this tract is owned by: \_\_\_\_\_  
 - and - \_\_\_\_\_  
 has a legal description of: \_\_\_\_\_

**Yes** - [Go to Question 3.]  
 **Don't Know** - [Go to Question 6.]  
 **No** - 2a. What is the Name and Address of the new operator(s)?  
 Operation Name: \_\_\_\_\_  
 Operator Name: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
 Phone: \_\_\_\_\_

2b. Was this tract split (is it now being operated by more than one person)?  
 **Yes** = 1  
 **Don't Know** = 2  
 **No** = 3

) **[Enter Code, then conclude interview.]** → 160 **Code**

3. FSA records show that there are XXX.X acres of **cropland** in the tract. Is this correct?  
 **Yes** - [Continue]     **No** - 3a. What is the **correct cropland acreage** for this tract? ..... **Acres** 200

4. Did you seed, or will you seed, any **Winter Wheat** for all purposes in FSA tract XXXX for the 1996 Crop Year?  
 **Yes** - 4a. How many acres of **Winter Wheat** have been seeded or will be seeded for all purposes for the **1996 Crop Year** in FSA tract XXXX? ..... **Acres** 300  
 **No** - [Continue]

5. Was any **Corn, Sorghum, or Soybeans** grown for any purpose in FSA tract XXXX during the **1995 crop year**?  
 **Yes** - [Complete the following for each crop.]

	Corn	Sorghum	Soybe
5a. How many acres of ( <i>crop</i> ) were <b>planted for all purposes</b> in FSA tract XXXX for the 1995 crop year? ..... <b>Acres</b>	401	501	601
5b. How many of the ( <i>Item 5a</i> ) acres were harvested for (either grain or seed) (beans)? ..... <b>Acres</b>	402	502	602
5c. What was the total (grain and seed) (soybean) production from these ( <i>Item 5b</i> ) acres? ..... <b>Bushels</b>	403	503	603
<b>OR</b>			
5d. What was the yield per acre of (grain and seed) (soybean) harvested? ..... <b>Bushels/Acre</b>	404	504	604

**No** - [Continue]

[Ask only if the operator was unable to report acreage/production data in the tract for questions 3 - 5; else skip to question 7.]

6. Could you report acreage data for [Check yes or no for each of the following, then conclude interview.]:  
 6a. Your FSA Farm Number (as reported above)?  **Yes**     **No**  
 6b. The total acres you operate (entire farming operation)?  **Yes**     **No**

Continue on Back

Which of the following were important in helping you to recognize the tract we were asking about?

Enter a code 1 for each that applies.

Tract Number .....  
 Total Tract Acres .....  
 Owner's Name .....  
 Legal Description .....

Code Yes = 1

700
701
702
703

Do you refer to any of the following to report the acreage and production for the tract?

Enter a code 1 for each that applies.

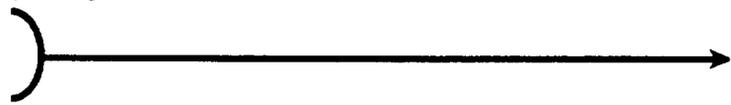
Any Type of FSA Report .....  
 FSA Photocopy of Tract .....  
 Other Records (What type of records? \_\_\_\_\_) .....

Code Yes = 1

800
801
802

What is the **easiest** way for you to report crop acreages? [Check one and enter code.]

- For a specific FSA Tract = 1
- For a specific FSA Farm = 2
- For your entire operation = 3

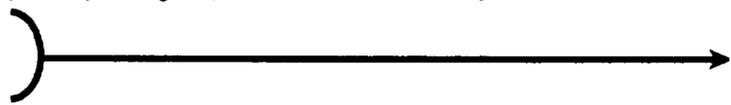


Code

850
-----

What is the most **accurate** way for you to report crop acreages? [Check one and enter code.]

- For a specific FSA Tract = 1
- For a specific FSA Farm = 2
- For your entire operation = 3



Code

855
-----

When we asked for the total acres of a particular crop in your entire operation, like total acres seeded to winter wheat in 1996 crop year, how would you arrive at a value? Would you:

- 1 = Know the total acres without doing any calculations
- 2 = Add up the acres in individual fields
- 3 = Add up the acres in FSA tracts
- 4 = Add up acres in another manner (Please specify: \_\_\_\_\_)
- 5 = Other (Please specify: \_\_\_\_\_)

Code

865
-----

Thank you for completing the survey. Thank you for your help.

Operator: Complete these items AFTER the interview.

Was the phone number printed on the questionnaire usable? .....

Did you have to contact someone other than the individual listed on the label for the information? .....

How many call attempts were made to complete this questionnaire? ..... Number

Approximately how many minutes did this interview last? ..... Minutes

Code  
Yes = 1 No = 3

900
901
902
903

IS:

Respondent's Name: \_\_\_\_\_ Date: \_\_\_\_\_ Phone #: \_\_\_\_\_

Respondent	Response Code	Enum.	Eval.	Julian Date	Nov 13-317	Nov 20-324	Nov 28-332	Nov 30-334	Dec 04-338	Dec 07-341	Dec 08-342	Dec 09-343	Dec 11-345	Dec 12-346	Dec 13-347	Dec 14-348	Dec 15-349	Dec 16-350	
Op/Ptnr SP Acct/Bkpr Oth Est R Est NR	2-Tel 3-Int 7-TR 8-IR 9-Inac	910	098	100	987														

E.N. \_\_\_\_\_

## Appendix B - Area Questionnaire



**NATIONAL  
AGRICULTURAL  
STATISTICS  
SERVICE**

U.S. Department of Agriculture  
Rm 5809, South Building  
Washington, D.C. 20250  
202-720-7017

### FARM SERVICE AGENCY TRACT REPORTING STUDY

Form Approved  
O.M.B. Number 0535-0140  
Approval Expires 6/30/97  
Project Code 520

This is (*enumerator name*) with the Kansas Agricultural Statistics Service. We are interested in obtaining data for the piece of land that you operate that is drawn off on the map. We are also contacting the operators of Farm Service Agency tracts (formerly ASCS). We will use the data we collect from both groups to produce acreage estimates for Kansas. The information you give will be confidential and response is voluntary.

1. Do you operate the land inside the blue tract boundary?

Yes - [Go to Question 2.]

No - 1a. What is the Name and Address of the new operator?

Operation Name: \_\_\_\_\_

Operator Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ [Conclude this interview and collect data from new operator!]

2. The next few questions are about the land inside the blue tract boundary.

How many total acres are inside the blue tract boundary? . . . . . Acres

110	
-----	--

3. How many of the total acres given above are cropland, including land in hay, summer fallow, and cropland in government programs? . . . . . Acres

200	
-----	--

4. Did you seed, or will you seed, any Winter Wheat for all purposes inside the blue tract boundary for the 1996 Crop Year?

Yes - 4a. How many acres of Winter Wheat have been seeded or will be seeded for all purposes for the 1996 Crop Year inside the blue tract boundary? . . . . . Acres

300	
-----	--

No - [Continue]

5. Was any Corn, Sorghum, or Soybeans grown for any purpose inside the blue tract boundary during the 1995 crop year?

Yes - [Complete the following for each crop.]

5a. How many acres of (crop) were planted for all purposes for the 1995 crop year? . . . . . Acres

5b. How many of the (item 5a) acres were harvested for (either grain or seed) (beans)? . . . . . Acres

5c. What was the total (grain and seed) (soybean) production from these (item 5b) acres? . . . . Bushels

OR

5d. What was the yield per acre of (grain and seed) (soybean) harvested? . . . . . Bushels/Acre

	Corn	Sorghum	Soybeans
401	501	601	
402	502	602	
403	503	603	
OR			
404	504	604	

Continue on Back

## Appendix B - Area Questionnaire

6. Was the cropland inside the blue tract boundary certified with Kansas FSA for the **1995 crop year**?

Office Use

*[Was FSA Form 578 completed for the land within the blue boundary? Certification does not require a farm to be entered in a farm program.]*

998

- Yes  
 Don't Know  
 No - What is the main reason you did not certify this land?

\_\_\_\_\_

\_\_\_\_\_

7. Was the cropland inside the blue tract boundary **certified** with Kansas FSA for the **1994 crop year**?

*[Was FSA Form 578 completed for the land within the blue boundary? Certification does not require a farm to be entered in a farm program.]*

- Yes - What county in Kansas did you certify in? \_\_\_\_\_  
 Don't Know  
 No

Office Use

999

This completes the survey. Thank you for your help.

**Notes:**

Respondent: \_\_\_\_\_ Date: \_\_\_\_\_ Phone: \_\_\_\_\_

Respondent	Response Code	Enum.	Eval.	Julian Date	Nov	Nov	Nov	Dec	Dec		
1-Op/Ptnr	101	2-Tel	910	098	100	987	13-317	20-324	28-332	04-338	11-345
2-Sp		3-Int					14-318	21-325	29-333	05-339	12-346
3-Acct/Bkpr		7-TR					15-319	22-326	30-334	06-340	13-347
4-Oth		8-IR					16-320	24-328	Dec	07-341	14-348
5-Est R		9-Inac					17-321	25-329	01-335	08-342	15-349
6-Est NR							18-322	27-331	02-336	09-343	16-350
S/E.N.											

Public reporting burden for this survey is estimated to average 15 minutes per response, including the time for reviewing instructions, gathering and maintaining the data needed, and completing the questionnaire. Send comments regarding this burden estimate or any other aspect of this survey, including suggestions for reducing the burden, to the Office of Management and Budget, Paperwork Reduction Project 0535-0140, Washington, D C 20503 Please DO NOT mail the questionnaire to this address

## Appendix C - Presurvey Letter

ID NUMBER  
NAME  
ADDRESS  
CITY, STATE ZIP

Dear Kansas Farmer:

The Kansas Agricultural Statistics Service is working with the Kansas Farm Service Agency (FSA) to determine the most efficient use of FSA information for conducting agricultural surveys. This survey will ask for FSA tract acreage information not currently available to us from FSA. The goal of our survey is to improve the quality of our acreage estimates as well as reduce costs. The success of this survey depends on your cooperation.

During the second week of November, one of our telephone enumerators will call you to ask some questions about a specific FSA tract that you may operate. We will be interested in the crops planted in FSA tract XXXX , which is part of Farm No. XXXX. This tract was certified in XXXXXXXXXX county.

Your response is voluntary and any information you supply will be kept strictly confidential and combined only with other reports so that individual records cannot be determined. We will not be giving any data from individual records to FSA.

Please contact me if you have any questions.

Sincerely,

T.J. Byram  
State Statistician

## Appendix D- Mathematical Formulae

Formula for all estimates came from Phil Kott's Staff Report 'Mathematical Formulae for the 1989 Survey Processing System Summary'.

The list acreage estimates in were calculated as:

$$Y_{\text{list}} = \sum_{h=1}^H Y_h$$

where

$$Y_h = e_h^* \sum_{i \in U_h} y_i = \sum_{i \in U_h} y_i^r$$

given

$H$  = number of stratum,

$U_h$  = set of selected units with usable item values in stratum  $h$ ,

$e_h^*$  = reweighted expansion factor ( $N_h/u_h$ ) for all selected units in list stratum  $h$ , where  $N_h$  is the total number of tracts in list stratum  $h$  and  $u_h$  is the number of selected units with usable item values in stratum  $h$ ,

$y_i$  = item value for selected unit  $i$ ,

$y_i^r$  = reweighted item expanded value ( $e_h^* y_i$ ) for selected unit  $i$ .

The variance for the list acreage estimate was calculated as:

$$V_{\text{list}} = \sum_{h=1}^H V_h$$

where the variables are as previously defined.

## Appendix D- Mathematical Formulae

The ratio estimates (yield and harvested/planted) were calculated as:

$$R_{list} = \frac{\sum_{h=1}^H Y'_h}{\sum_{h=1}^H X'_h}$$

where

$$Y'_h = e'_h \sum_{i \in M_h} y_i = \sum_{i \in M_h} y_i^r \quad \text{and} \quad X'_h = e'_h \sum_{i \in M_h} x_i = \sum_{i \in M_h} x_i^r$$

given  $M_h$  = set of selected units with both usable  $y_i$  and  $x_i$  item values in stratum  $h$ ,

$e'_h = N_h/m_h$ , where  $N_h$  is the total number of tracts in stratum  $h$  and  $m_h$  is the number of selected units in  $M_h$ .

and where the other variables are as previously defined.

The variance estimates for the ratio estimates were calculated as:

$$V_R = R_{list}^2 \left( \frac{\sum_{h=1}^H V_{hyy}}{\left(\sum_{h=1}^H Y'_h\right)^2} - 2 \frac{\sum_{h=1}^H V_{hyx}}{\left(\sum_{h=1}^H Y'_h\right) \left(\sum_{h=1}^H X'_h\right)} + \frac{\sum_{h=1}^H V_{hxx}}{\left(\sum_{h=1}^H X'_h\right)^2} \right)$$

$$V_{hyx} = [(N_h - m_h) / N_h][m_h / (m_h - 1)] \left[ \sum_{i \in M_h} y_i^r x_i^r - \left(\sum_{i \in M_h} y_i^r\right) \left(\sum_{i \in M_h} x_i^r\right) / m_h \right] \quad \text{for } m_h > 1$$

$$= (Y'_h)(X'_h) / 2 \quad \text{for } m_h = 1,$$

is undefined otherwise.

where

$V_{hxx}$  and  $V_{hyy}$  follow directly from the above formula (for example: change all  $y$ -values in  $V_{hyx}$  to  $x$ -values to get  $V_{hxx}$ ) and all other variables are as defined above.

## Appendix E - Details of Survey Estimates

### Winter Wheat Seedings for 1996 - Kansas

Strata	Population	Sample	Positive Usable Reports	Expanded Wheat Seedings	C.V.
FSA Tract Acreage Study				(000)	
1	13,986	25	1	106	99.9
2	33,419	100	23	307	22.8
3	12,198	50	12	330	31.0
4	304	25	3	12	65.4
5	56,503	100	62	1,814	8.9
6	62,719	275	183	4,106	4.7
7	23,171	200	147	2,981	4.7
8	6,327	100	67	1,496	7.0
9	453	50	29	259	12.7
List	209,080	925	527	11,411	3.1
NOL		43	12	98	35.5
FSA Tract Acreage Study		968	539	11,509	3.05
December Ag. Survey				11,624	2.76
Ag. Statistics Board				11,800	

### 1995 Corn - Kansas

Strata	Population	Sample	Planted			Harvested		Yield	C.V.	Harvested To Planted Ratio	C.V.
			Positive Usables <sup>1/</sup>	Expanded Acres	C.V.	Expanded Acres	C.V.				
FSA Tract Acreage Study				(000)		(000)					
1	13,986	25	0	0	0	0	0	0	0	0	0
2	33,419	100	12	204	33.3	204	33.3	110.0	20.2	1.00	0
3	12,198	50	11	302	30.1	284	32.2	114.4	15.1	1.00	0
4	304	25	6	24	43.8	23	45.5	143.2	9.4	0.97	2.69
5	56,503	100	5	110	54.3	107	53.7	114.0	8.2	0.98	1.45
6	62,719	275	29	699	19.7	689	19.8	123.3	8.9	0.99	1.04
7	23,171	200	33	504	19.0	497	19.1	127.4	7.8	0.99	1.47
8	6,327	100	15	295	25.8	280	26.8	134.3	8.4	0.95	4.25
9	453	50	11	82	26.8	82	26.8	144.3	6.5	1.00	0.23
List		925	122	2,220	10.2	2,166	10.3	124.1	4.3	0.984	0.73
NOL		43	0	0	0	0	0	0	0	0	0
FSA Tract Total		968	122	2,220	10.2	2,166	10.3	124.1	4.3	0.984	0.73
December Ag. Survey				2,016	6.9	1,923	6.8	123.8	3.1	0.953	
Ag. Statistics Board				2,150		1,970		124.0		0.920	

<sup>1/</sup> Positive usables by stratum given for planted acres only. Counts of positive usables for harvested, yield and h/p ratio at the state level were 118, 112, 118.

## Appendix E - Details of Survey Estimates

### 1995 Soybeans - Kansas

Strata	Population	Sample	Planted			Harvested		Yield	C.V.	Harvested To Planted Ratio	C.V.	
			Positive Usables <sup>1/</sup>	Expanded Acres	C.V.	Expanded Acres	C.V.					
FSA Tract Acreage Study				(000)		(000)						
1	13,986	25	0	0	0	0	0	0	0	0	0	
2	33,419	100	26	392	20.5	392	20.5	24.3	5.6	1.00	0	
3	12,198	50	14	318	25.6	300	27.2	25.4	14.0	1.00	0	
4	304	25	5	17	40.5	17	40.5	28.3	15.9	1.00	0	
5	56,503	100	9	201	36.0	193	36.0	33.9	25.5	0.96	3.73	
6	62,719	275	35	548	19.4	517	20.2	24.7	11.3	1.00	0	
7	23,171	200	22	203	27.2	203	27.2	25.1	12.4	1.00	0	
8	6,327	100	11	128	33.3	128	33.3	29.5	14.3	1.00	0	
9	453	50	1	2	96.4	2	96.4	43.0	0	1.00	0	
List		925	123	1,808	10.3	1,752	10.5	26.2	6.4	0.996	0.44	
NOL		43	6	38	46.8	25	51.4	26.4	17.9	0.653	40.0	
FSA Tract Total			968	129	1,846	10.1	1,777	10.4	26.2	6.4	0.988	0.87
December Ag. Survey				2,458	6.9	2,430	6.8	25.7	3.1	0.989		
Ag. Statistics Board				2,100		2,050		25.0		0.976		

<sup>1/</sup> Positive usables by stratum given for planted acres only. Counts of positive usables for harvested, yield and h/p ratio at the state level were 126, 120, 125.

### 1995 Sorghum - Kansas

Strata	Population	Sample	Planted			Harvested		Yield	C.V.	Harvested To Planted Ratio	C.V.	
			Positive Usables <sup>1/</sup>	Expanded Acres	C.V.	Expanded Acres	C.V.					
FSA Tract Acreage Study				(000)		(000)						
1	13,986	25	0	0	0	0	0	0	0	0	0	
2	33,419	100	26	369	19.5	361	19.9	63.8	8.8	0.98	2.24	
3	12,198	50	10	324	30.0	273	32.0	60.7	5.2	0.84	16.81	
4	304	25	4	10	63.2	10	65.9	39.9	54.7	0.96	4.57	
5	56,503	100	17	322	24.4	282	26.7	53.6	15.3	0.88	9.00	
6	62,719	275	73	976	12.8	944	13.2	51.7	5.1	0.97	1.49	
7	23,171	200	68	652	11.6	629	11.9	55.1	5.9	0.96	1.87	
8	6,327	100	20	259	23.6	257	23.8	48.8	13.9	0.99	0.90	
9	453	50	8	25	36.7	25	37.5	64.5	13.5	0.96	2.92	
List		925	226	2,938	7.1	2,780	7.7	54.9	3.3	0.946	2.11	
NOL		43	6	27	50.9	27	51	53.8	15.0	1.000	0	
FSA Tract Total			968	232	2,965	7.0	2,807	7.7	54.9	3.3	0.946	2.09
December Ag. Survey				3,428	4.4	3,224	4.6	55.9	2.5	0.937		
Ag. Statistics Board				3,300		3,100		56.0		0.939		

<sup>1/</sup> Positive usables by stratum given for planted acres only. Counts of positive usables for harvested, yield and h/p ratio at the state level were 220, 207, 220.