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RESTRUCTURE OF THE U.S. AGRICULTURE CENSUS

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1. PURPOSE OF THIS PAPER

1. This paper describes the changes in procedures being planned for the 1997 Census of Agriculture in the United States. It illustrates alternatives that are possible when a census is conducted by a decentralized organization instead of a centralized one. It is intended to present an overview of changes and benefits but not get into technical details.

2. BACKGROUND

2. Agricultural censuses have been conducted in the United States since 1840. Up to 1920, they were conducted every 10 years, in conjunction with the decennial census of population. The first mid-decade agricultural census was conducted in 1925 and censuses have been conducted approximately every 5 years since 1925. In recent times, the agricultural census has collected data for years ending in 2 and 7, matching the timing of other U.S. economic censuses.

3. Ever since 1969, the agricultural census has been a mail out-mail back collection, conducted by the Bureau of the Census of the U.S. Commerce Department. Most of the preparatory work, editing, and analysis for the agricultural censuses has been done either at the Bureau of the Census headquarters in the Washington, D.C. area or at the large scale processing center in Jeffersonville, Indiana.

4. The National Agricultural Statistics Service (NASS) of the U.S. Department of Agriculture assisted with each periodic census by submitting its list of farm operations as one mailing list input and helping in the final edit review. NASS did not participate in planning operations and did not receive any access to the final census mail list or to any census data.

5. The congressionally allocated budgets for all of the planned 1997 economic censuses were far short of the Bureau of the Census projected budget needs. In order to adapt to the expected lower budgets, the Bureau of the Census announced tentative plans to change the definition of a farm from \$1,000 to \$10,000 in sales (which would eliminate about half of all U.S. farms) and to discontinue censuses in outlying areas of the U.S. (Puerto Rico, the U.S. Virgin Islands, Guam, and the Northern Mariana Islands) and any follow-on data collections (horticultural and irrigation censuses).

6. There was a quick and demonstrative reaction to the farm definition change proposal from the U.S. Department of Agriculture, State Departments of Agriculture (some States would lose up to 80 percent of their farms), and many agricultural and rural data analysts. Besides the abrupt change in a long standing data series and the loss of so much rural information, it was pointed out that the Agriculture and Commerce Departments had always cooperated in the past in any farm definition changes.

7. The U.S. Office of Management and Budget offered a solution by working to transfer the responsibility for the periodic agricultural censuses to NASS. That brought the census under different congressional budget authorizing committees. The funding for NASS (at the original projected

level) did pass both Houses of Congress. However, the authorizing legislation to permanently shift the authority for the census passed the House of Representatives but was not acted upon by the Senate. That legislation is being resubmitted for the current congressional session. Plans are proceeding for NASS to conduct the 1997 census, with Bureau of the Census assistance as needed.

3. FARM DEFINITION:

8. There had historically been a few small differences between NASS and the Bureau of the Census in technical aspects of the farm definition. If a farm converted all of its cropland area to a long-term farm program and received payments for not growing crops, NASS continued that operation as a farm (if normal production value met the \$1,000 definition) but Census did not. If equine were the only livestock on a farm, NASS did not award equivalent value points for pasture but Census did. The third major difference between the two agencies was the fact that NASS considered an operation a farm which produced Christmas trees as the only cash crop (if it met the dollar limit).

9. Representatives of the two agencies met several times after the 1992 Census of Agriculture to reconcile differences in definitions. All three main differences were resolved in the favor of including the operations as farms. Appropriate changes in wording and definitions were prepared and tested for 1997 questionnaires.

4. QUESTIONNAIRES

10. The Census of Agriculture collects a wide variety of information. All operations are asked questions on land ownership; crops produced including fruits, vegetables, and horticultural specialties; value of crops produced; area of the farm not currently in crops; livestock production; government farm program participation; direct market sales; farm labor; organizational structure; and farm operator demographics. In addition, a sample of operations receive extra questions on farm expenditures, machinery, and land value.

11. Prior census information is used to determine sampling rates for the longer questionnaire versions. All large operations receive these questions. Sampling rates for other operations depend on the number of farms per county and variations in production value. New operations and small operations from the previous census may be mailed a version which utilizes a skip technique if an operation did not produce any livestock or grow any crops in the census year.

12. The only changes from the 1992 to the 1997 questionnaire were those needed to implement the agreed to standardization of farm definitions. While the "no change" decision had been made before there was any consideration of NASS taking over the census, that decision will help in ensuring that a comparable census can be conducted by NASS.

5. MAIL LIST

13. Since the U.S. does not have an agricultural register, it has been necessary to construct a mail list for each agricultural census. A number of different lists have been tested as inputs for censuses over time. Lists that did not provide many unique names of actual farms or which did not add strength to the probability of a match group being a farm, when the various lists were matched and unduplicated, were rejected for future censuses.

14. For the 1997 Census of Agriculture, the main list sources to be input into the list building process are the 1992 census mail file, the NASS list sampling frame, and lists of individuals filing a farm income tax return (the tax list does identify some operations not on other farm lists but it also includes people who are not farm operators but may have some financial ownership interest in a farm and receive some favorable tax treatment). A few speciality lists (such as horticulture interests) are also used.

15. The farm income tax records present a particular challenge during the changeover of census responsibilities. The income tax files have been sharable with the Bureau of the Census only through specific legislation. Also, no use was to be made of records which came only from the income tax files, such as sampling for any special surveys, until they had been contacted and filled out a census form.

16. The Bureau of the Census had already contacted the Department of Treasury to arrange for farm tax files to be used for the 1997 census before the responsibility was changed to NASS. The proposed new authorizing legislation was written such that the existing Bureau of the Census authorities could be used for the tax files in 1997. New NASS-Department of Treasury legislation will probably be needed for the future.

17. Another sticky point in preparing the 1997 mail list is that previous censuses have been collected under Census confidentiality legislation which allowed only Census employees to access any data. In the past, NASS employees helping with the final edit have been allowed access as "special sworn Census employees" during the review period. NASS is attempting to work out arrangements to provide access to 1992 files in its State Statistical Offices (SSO's) under this sworn employee provision. NASS offices will have to meet rigorous security provisions in order to finalize that approach. It is hoped that the new authorizing legislation to transmit the authority for the census will be judged to also transfer the access to previous census files.

18. Nearly 9.1 million name and address records have been assembled for building the 1997 census mail list. Record linkage routines and probability of a farm computations should reduce the list to 3.8 million or so unique records. It is hoped that the NASS SSO's can work with the tentative mail list and use list sampling frame expertise and supplementary information to reduce the final list to less than the 3.5 million mailed in 1992 without increasing the undercoverage. If that can be accomplished, there will be considerable cost and time savings in conducting the 1997 census.

6. STAFFING

19. As mentioned earlier, most work on previous agricultural censuses was done at the Bureau of the Census headquarters and in Jeffersonville, Indiana. A number of individuals had full time agricultural census assignments at the Bureau of the Census headquarters and there were normally three full-time employees in Jeffersonville. During the mailing, return crediting, key entry, and editing stages, a large number of census part-time or temporary employees were employed. A similar approach will be used for the 1997 census and NASS will reimburse the Bureau of the Census for necessary Jeffersonville operations.

20. The Bureau of the Census has gone to a very functional management organization in recent years. Therefore, many agricultural census preparatory, data processing, and data dissemination functions were performed by individuals not included among the 100 or so employees of the Agricultural and Financial Surveys Division (AFSD) of Census. This meant that NASS did not acquire the full range of employees and skills needed for the census when employees were transferred from the Bureau of the Census. It acquired about two-thirds of the number of employees normally involved in Census operations. Some preparation functions had already been finished, some programmers not in AFSD were transferred to NASS, and other functions are being provided under a contractual arrangement.

21. During the interim period while arrangements for the transfer of Bureau of the Census employees were being finalized, NASS detailed several employees to the agricultural census operation to fill specific vacancies. Most of those detailees became employees of the new NASS Census Division.

22. The shift to NASS means that employees across the 1,100 member NASS Headquarters and SSO staffs can be called upon for specific census activities, as well as the corps of experienced telephone and field enumerators. NASS hopes to make several improvements by use of those decentralized resources.

7. PUBLICITY

23. One advantage of the NASS Census role will be the capability to provide more local pre-census publicity and to attend more farm organization meetings than when only a small central staff was available. Many previous public service announcements and publicity materials to government and media organizations will be used but there will be a strong within State emphasis.

24. A NASS-Bureau of the Census committee was set up early which included some NASS State Statisticians to select which publicity approaches would be accepted. One new emphasis in 1997 is the utilization of Internet for providing past census data, for answering common questions, and for providing a tie from NASS to the past census results.

8. MAILING AND HANDLING

25. Even though NASS SSO's conduct many surveys each year and are

experienced in most survey operations, there is no quick replacement for the special handling experience and equipment that the Bureau of the Census already has in Jeffersonville. Questionnaires for the 1997 census will come from the printer already in envelopes. Special equipment will be used to print names and addresses plus bar codes for improved accounting for returned questionnaires. Some forms will be removed from the mailing process as described in topic 10 below but even those will be tracked by the Jeffersonville survey management system.

26. Besides check in, the Jeffersonville operation will perform the data entry operations. Since NASS has a goal of speeding up data availability by almost one full year, two key entry shifts are envisioned. Basic data editing steps will also be performed at Jeffersonville, utilizing a few NASS Agricultural Census Division personnel and some Census Bureau trained editors.

9. TELEPHONE ASSISTANCE

27. One important key to NASS plans to improve customer service and speed up processing is that toll free telephone assistance will be provided throughout the data collection process. A large number of individuals (including some part-time interviewers) will need to be trained in each SSO to handle the expected large volumes of calls after the original mail out and each followup mailing.

28. If this effort to provide the direct telephone response service is successful, it should speed up the flow of questionnaires, identify many out-of-scope operations which will not need followup mailings, and identify a number of operations which received multiple questionnaires. These will be major steps in the effort to speed up the entire census process.

29. One toll free number will be published for the country but calls within each State will be routed to their respective SSO. Telephone answerers will be trained to handle routine questions and to ask basic probing questions if an individual feels they should not have received a questionnaire. It is hoped that each SSO will have immediate lookup access to the mail list for their State(s) in order to make corrections and account for record status on the screen. If this is not feasible, interviewers will take down all identification numbers and detailed operation name details, perhaps by use of a CATI routine.

10. SURVEY COORDINATION

30. Because the 1997 Census of Agriculture will be mailed during an always busy NASS survey period, three specific actions will be taken: (1) NASS SSO's will minimize the number of mail contacts for the annual end-of-season acreage and production (A&P) surveys that are a major input to creating crop county estimates. Those A&P samples usually include many "criteria" mailings--that is, operations which have not been sampled for 3 years or so and for which updated control data are desired. These extra criteria samples will be skipped since the Census of Agriculture will be available within a few months. (2) Most large operations in the end-of-year *Hogs* and *Cattle*

surveys will receive a personal visit in which an attempt will be made to collect both cattle and census data. It is hoped, at least, that the current information can be obtained and questions about the census form answered so the form will be quickly returned. (3) For NASS survey mailings where it is not possible to coordinate a census contact, presurvey letters will explain why both census and current survey operations are being conducted.

31. Personal and telephone interviewers on any NASS surveys during December 1997 to February 1998 will receive training on the census and will be able to answer questions. In some cases, personal interviewers may help fill out some census questionnaires.

32. In addition to the personal contacts on the *Cattle* survey, many other large or multi-State operations will receive a personal visit or a special telephone call. This will ensure that these operations are accounted for correctly, and early in the survey process. It would not be possible to do much contact work without the NASS SSO structure.

11. TIMING AND FOLLOWUP

33. The 1997 census will be mailed about mid-December of 1997. The listed completion date is February 1, 1998 but survey letters will encourage response as soon as possible. A thank you/reminder postcard will be mailed about mid-January to all operations.

34. A total of up to three additional requests (each with another questionnaire) at approximately monthly interviews, will be mailed if a response is not received by February 1. However, larger operations will normally be contacted by a telephone call instead of relying on the mail reminders. Other telephone followups will be used for States and counties with low response rates.

35. Final data collection must be finished during the month of May in order to meet target summary and publication dates.

12. TELEPHONING

36. In previous censuses, all telephone followups were done by Bureau of the Census Computer Assisted Telephone Interviewing (CATI) centers which conduct a number of telephone surveys. One major 1997 change is the shift of telephoning to the NASS SSO's. This offers much more flexibility than in previous censuses when priorities for agricultural census followups depended upon the press of other economic censuses and on-going Bureau of the Census conducted surveys.

37. SSO's will have some latitude to shift telephone followups of larger or specialized operations to personal interviews. They will also be able to try various times of day in order to obtain the best response rates.

38. The total number of CATI telephone calls cannot be fully estimated ahead of time. If the early contact efforts and the toll free service are successful, fewer CATI telephone calls will be required. On the other hand,

success of the early efforts plus a large number of CATI calls may result in higher completion rates than in earlier censuses.

13. ANALYTIC REVIEWS

39. Since all returned questionnaires are mailed to Jeffersonville, Indiana, the basic editing takes place at that location. NASS will likely supplement the three on-site statisticians during the main editing step. A number of standardized edits for yields, values per head of livestock, etc., are built in. There are also several imputation routines such as extracting missing yields from another record of the same size farm in the same geographic area. A number of clerical editors will be trained to review the editing outputs.

40. Once most counties in a State are nearly complete, an analytic summary is created. This summary will adjust for missing operations so a preliminary total county record is created.

41. This analytic summary will be reviewed in each SSO. The SSO will look closely at unexplained changes in crop areas, livestock numbers, or number of operations. The 1992 census results and subsequent NASS surveys will serve to identify possible errors. It will be feasible during the analytic review to "drill down" to specific records if county totals seem high or low. While it is expected that most adjustments or corrections during the analytic review can be done by examining the original reported data (for keying errors), it will be possible to telephone operations to verify unusual reports.

14. SUMMARIZATION PLANS

42. In past agricultural censuses, processes have concentrated on a few of the 50 States at a time. The data for two to four States might be all keyentered before starting on another batch of States. (Results from earlier censuses provided information on which States tended to respond quickly.) Similarly, editing, CATI telephone calls, and analytic reviews all involved this State batching approach. State level publications were also finished and published on a flow basis.

43. Under the former centralized organization structure, the batching made good sense. As soon as possible, people who were going to concentrate on specific editing, analysis, or summarization processes were started on their assignments. The State of Delaware, with only three counties and about 3,000 farms, was normally processed first through all activities as a production level test.

44. Since all SSO's are available to help on the 1997 agricultural census, work will proceed on all States at one time. (There still may be interest in using Delaware to test all procedures, however.) It is hoped that the key entry staff can stay relatively current by utilizing two shifts per day. The editing staff will proceed as soon as possible with records keypunched to date regardless of State location.

45. NASS hopes to complete all processing and be able to create national totals by the end of calendar year 1998. That would mean that census U.S. level results would be available nearly one year faster than normal. It also would mean that review and any needed revision of on-going statistical data series would occur a year earlier and be on the same schedule as operational 1-year later revisions.

15. PUBLICATION PLANS

46. While the summarization plan above will create summaries for the U.S. faster than in the past, it will seem to some data users that publication has been slowed down. This is because publication of State level data summaries was also done on a flow basis in the past. In fact, the U.S. totals were not even created until many State publications had been released.

47. While the release of State summaries on a flow basis helped to smooth out the operational flow and get all specialists involved as soon as possible, it was also a source of confusion and some frustration. As soon as an early State publication was released, officials in surrounding States became anxious for their publications, which resulted in letters and telephone calls to Census officials. It also was necessary to "hold back" some States to use for confidentiality or other corrective adjustments when processing got close to national totals.

48. NASS will have preliminary State totals before the national totals are created. However, NASS will use its normal review processes of examining the country level totals first and then regional and State before releasing any figures. The national level review might possibly identify potential errors not evident when States are reviewed individually.

49. Since there will be a big backup of publications, State totals will be first released with the national release and then the traditional State level publications, which include county data, will be created. All summary level data will be available electronically on Internet and CD-ROM's. Thus, all summaries can be released within a few days--if not all on one day--electronically. Press releases will be prepared which highlight relevant figures in each State. Paper publications will be prepared, but many fewer copies are expected to be printed than for earlier censuses.

50. Another major goal of the revised processing procedures is to expand the amount of and greatly advance the timing of Census coverage information. The annual NASS area frame survey has long been used to estimate the numbers of farms not included on the Census mail list. A coverage evaluation sample was selected to estimate duplication and misclassification within the Census responses. Coverage evaluation results were normally not published until well after printed summaries had been released. Coverage evaluations also concentrated on estimating the numbers of missing farms with certain characteristics (such as income classes, presence of livestock, etc.) rather than estimating under counted crop and livestock statistics. Therefore, the coverage evaluation results were not helpful for revising the current data series.

51. Expanded emphasis is being placed on the 1997 coverage evaluation. It is hoped that preliminary coverage evaluation results will be available at the same time as the national data summaries. It is also planned to calculate undercoverage estimates for many agricultural commodities such as the number of cattle and hogs and area of corn, wheat, and soybeans. Those new estimates will be particularly valuable for revising current data series.

16. FUTURE PLANS

52. A number of alternatives will be considered for future improvements of Census data and procedures. Since the Census name, address, and data results will be merged with the NASS list frame, it will not be necessary to repeat all of the list build operations for future censuses. It will also be possible to identify all farm operations which did not report during the Census data collection period and were accounted for by imputation. Those operations will be given a high priority for followup contacts during the first 2 years after the census to properly determine operation characteristics.

53. A number of census editing and processing programs will need to be rewritten after the 1997 census. Those will be written to be more compatible with operational NASS software systems and to utilize data warehousing techniques that NASS will be implementing.

54. It is likely that NASS will take a broader look at questionnaire content for the expected 2002 census, particularly in light of many structural changes occurring in U.S. agriculture. There will also be new consideration of including an emphasis on the role of women in agriculture (perhaps by allowing for shared operatorships).

55. If data warehousing efforts are successful, it may be possible to utilize much more previously reported operation data in conducting the 2002 census. As a minimum, more data will be available for editing but it may be possible to use data also to tailor questionnaires or to identify specific operations for telephone or personal contacts.