

**OMB INFORMATION COLLECTION SUPPORTING STATEMENT**  
**National Program 216 Technology Transfer Project – End Users Inputs**

The Agricultural Research Service's (ARS) Agricultural System Competitiveness and Sustainability National Program (NP 216) focuses on understanding how farms function and how changing or introducing new technology will affect their productivity, profitability, energy efficiency, and natural resource stewardship. Scientists in this program specifically conduct research to develop sustainable farming practices. This farmer survey will collect information needed to streamline the transfer of new farming technology developed by ARS scientists. It will identify current preferences of farmers and help develop alternatives to current technology transfer practices used by ARS scientists. This survey of end-users is critical to identifying farmer preferences in receiving ARS technology.

**A. Justification**

**1. Explain the circumstances that make the collection of information necessary. Identify any legal or administrative requirements that necessitate the collection. Attach a copy if the appropriate section of each statute and regulation mandating or authorizing the collection of information.**

ARS scientists in the NP216 program conduct research on developing farming practices that improve sustainability of family farms. Past and current research areas include the following:

- a) *Management practices for cover crops*
- b) *Management practices for crop and animal systems*
- c) *Management practices to improve soil quality*
- d) *Management practices to improve animal production*
- e) *Management practices for conservation tillage systems*
- f) *New equipment for crop management in conservation tillage systems*
- g) *Alternative crops*
- h) *Computer applications for decision support*

The transfer of new research technology from this program to farmers has previously been conducted primarily indirectly through university extension programs and with the assistance of the USDA Natural Resources Conservation Service (NRCS). In addition, many ARS scientists in NP216 participate directly in the technology transfer process through workshops, field days and farmer meetings. The technology transfer process has used various media including *electronic, print, and face-to-face*. Although these approaches have proven effective in the past, changes in electronic media and venues for delivering technology have changed rapidly. This brings to question how effective our technology transfer efforts are at present and what the preferences of farmers might currently be for receiving information about new technologies. To answer these questions specifically for the NP216 program we undertook this project to survey farmers about

their knowledge of ARS NP216 technologies. This survey will be conducted to get farmer input to help improve the ARS technology transfer process and meet farmer technology transfer preferences. The survey will determine farmers' awareness about ARS research information; their current use of information; preferred communication channels and institutional channels to get research information; and their suggestions to improve the technology transfer process. This information will be used to develop guidelines for ARS scientists to improve the diffusion of new farming systems technology.

The first step of developing more effective methods for delivering new technology to farmers is to assess the effectiveness of the current technology transfer methods and gather information as to how the farmers would prefer to learn about new technology. This is the purpose of this survey. Adoption of new practices is often constrained by perceptions and attitudes, as well as from a lack of technical knowledge (Jayaratne et al., 2007). Further diffusion of technology depends on efficient and effective transmission of research results to farmers through appropriate extension methodology (Jayaratne et al., 2008).

Until new technology is transmitted and adopted by end users there is no impact of research products. This underscores the significance of diffusing new technology for achieving desired outcomes of systems research and keeping research investments cost effective. How attributes of a new technology affect its rate of adoption are little understood (Rodger, 1995). Diffusion of new systems practices is somewhat different from diffusion of an innovation like hybrid corn (Pampel & Van Es, 1977). Transfer of systems technology seems to be a "mutual and shared" learning process (Kroma, 2006). Direct knowledge and information about how new practices work and interact with current practices to influence productivity and profitability is often required by farmers prior to adoption of new practices. While increasing awareness may not lead to adoption, recognizing system benefits is the first necessary step to adoption (Agunga, 1995). A study suggests that "Extension techniques, rich with opportunities to see, hear, and talk attract early users and further enabled them to diffuse conservation tillage technology to other farmers" (Dillman, et al., 1989). Better understanding of these factors is essential for achieving desired learner outcomes and will contribute to improving the cost effectiveness of research investments.

There are no legal or administrative requirements that necessitate the collection of this data only a desire by scientists in the NP216 program to improve the effectiveness of the programs technology transferee process. The need to identify effective methods for delivering new systems-based technology in a customer-friendly manner is critical to achieving significant impact from research investments. The results of this survey will be used by the NCSU evaluation specialist and the ARS members of the Technology Transfer Working group (TTWG) to develop a summary report and recommendations for improving the technology transfer process by scientist in the NP216 program. The document will be used within ARS to improve the technology transfer process in this national program and possibly in other National Programs in the Natural Resources area.

## References

- Agunga, R. A. (1995). What Ohio Extension agents say about sustainable agriculture. *Journal of Sustainable Agriculture*, 5(3), 169-187.
- Diekmann, F. & Batte, M. T. (2009). Examining information search strategies of Ohio farmers. *Journal of Extension* [On-line], 47(6) Article 6FEA8. Available at: <http://www.joe.org/joe/2009december/a8.php>
- Diliman, D. A., Engle, C. F., Long, J. S., & Lamiman, C. E. (1989). Others influencing others. *Journal of Extension*, 27 (1). Retrieved January 6, 2008 from <http://www.joe.org/joe/1989spring/a5.html>
- English, B. C., Jensen, K. & Menard, J. (2005). Will Tennessee soybean producers support a biodiesel cooperative? *Journal of Extension* [On-line], 43(1) Article 1RIB2. Available at: <http://www.joe.org/joe/2005february/rb2.php>
- Jayaratne, K. S. U., Gaskin, J. W., Lee, R. D., & Reeves, D. W. (2007). Significance of Attitude as a Determinant of Agricultural Extension Agents' Motivation for Delivering Conservation Tillage Programs: Directions for Planning In-service Training. Proceedings of the 23rd Annual Conference of the International Association for Agricultural and Extension Education, (May 20-24). Polson, Montana.
- Jayaratne, K. S. U., Gaskin, J. W., Lee, R. D., & Reeves, D. W. (2008). Extension Agents' Educational Preferences for Learning about Conservation Tillage Systems. Paper accepted for the Southern Agricultural Education Research Conference in Dallas, Texas, in February 2-5, 2008.
- Krejcie, R. V. & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30, 607-610.
- Kroma, M. M. (2006). Organic farmer networks: Facilitating learning and innovation for sustainable agriculture. *Journal of Sustainable Agriculture*, 28 (4). 5-27.
- Pampel, F. Jr., & Van Es, J. C. (1977). Environmental quality and issues of adoption research. *Rural Sociology*, 42 (1), 57-71.
- Rodgers, E. M. (1995). *Diffusion of innovations* (4th ed.). New York: The Free Press.

**2. Indicate how, by whom, and for what purpose the information is to be used. Except for a new collection, indicate the actual use the agency has made of the information received from the current collection.**

The results of the survey will be summarized and developed in to a report by the NCSU evaluation specialist and the ARS scientists (five) that are part of the Technology Transfer working group (TTWG). The report will summarize farmer opinions about the current state of ARS technology transfer efforts and provide guidance as to how to improve the process. The report will be distributed to the scientists in the NP216 program to provide them feed back on the effectiveness of their technology transfer. The results will also be used by the TTWG to develop a set of guidelines for scientist in the NP216 program to help improve their technology transfer efforts. Other Natural Resource programs within ARS will have access to the final report and recommendations but not to the originally collected data.

**Who will use the information?**

North Carolina State University Extension program Evaluation specialist, Dr. Jayaratne will provide the evaluation leadership in this project. Agricultural and Extension Education doctoral graduate assistant provides necessary technical assistance during the project. Dr. Jayaratne will closely work with the NP-216 project Technology Transfer Group in conducting this evaluation research. The information collected will be used by the Technology Transfer Group for the development of educational programs and communication methods for transferring NP 216 technologies to end-users effectively. The summary of information will be used by ARS National Program staff to help improve technology transfer efforts of other National Programs. The NCSU cooperator and his graduate student will develop a professional journal article based on the results.

**Purpose of the information:**

The information collected from this survey will be part of the technology transfer evaluation project and will contribute to enhance the effectiveness of the technology transfer process and document the impacts of the Agricultural System Competitiveness and Sustainability National Program.

**3. Describe whether, and to what extent, the collection of information involves the use of automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, e.g. permitting electronic submission of responses, and the basis for the decision for adopting this means to the collection. Also describe any consideration of using information technology to reduce burden.**

Information will be collected through a mail survey and phone calls to a random sample of the nonrespondents. This will be an effective way to reach the target audience which may contain a substantial fraction that have limited electronic media

access. We will use telephone interviews to address nonresponse error by contacting a random sample of nonrespondents. The survey is brief which will minimize the time required taken for completing it.

**4. Describe any efforts to identify duplication, show specifically why any similar information already available cannot be used or modified for use of the purposes described in item 2 above.**

A survey of this type has not been done by the Agricultural Research Service or anyone else to our knowledge before. No similar information exists.

**5. If the collection of information impacts small businesses or other small entities (Item 5 of OMB Form 83-I), describe any methods to minimize the burden.**

The impact of this survey on small businesses (i.e. small farmers) will be very little. The survey is voluntary and is expected to take approximately ten minutes.

**6. Describe the consequence to Federal program or policy activities if the collection is not conducted or is conducted less frequently, as well as any technical or legal obstacles to reducing burden.**

Without knowing how farmers are currently receiving and how they would prefer to receive new technology information that impacts their operations, National Program 216, the Agricultural System Competitiveness and Sustainability National Program, will not be able to effectively improve its technology transfer process. This would greatly affect the effectiveness and impact of this National Program on the U.S. agricultural community.

**7. Special Circumstances Relating to Guidelines 5 CFR 1320.5**

There are no special circumstances that:

- require respondents to report information more than quarterly. It is anticipated the survey will be done only one time.
- require respondents to prepare a written response to a collection of information in fewer than 30 days.
- require respondents to submit more than an original and two copies of any document. -require respondents to retain records of any kind.
- this is a statistically sound survey.
- no pledge of confidentiality is made and no personal identification information is being collected.-no proprietary or trade secrets are being collected.

**8. Comments in Response to the Federal Register Notice and Efforts to Consult Outside Agency.**

No comments were received. Federal Registry Notice is attached to this submission.

**9. Explain any decision to provide any payment or gift to respondents, other than remuneration of contractors or grantees.**

No payment or gift will be provided to respondents.

**10. Describe any assurance of confidentiality provided to respondents and the basis for the assurance in statute, regulation, or agency policy.**

No assurance of confidentiality is made and no personal identification information is being collected.

**11. Justification for Sensitive Questions**

No questions of a sensitive nature are being asked.

**12. Provide estimates of the hour burden collection of information. Indicate the number of respondents, frequency of response, annual hour burden, and an explanation of how the burden was estimated.**

Number of farmers we planned to contact	Number of responses anticipated	Time required for survey	Total Annual Burden Hours
5113	1534	10Minutes	315*

\*The total annual burden hours is based on 255 hours (10 minutes per respondent) taken by 1534 respondents and 60 hours (1 minute/nonrespondent) taken by 3579 nonrespondents to trash their surveys.

Farmers and land managers will be completing the survey. The total estimated cost to respondents is \$15,750.

Activity	Number of Hours	Cost per hour	Total Cost
Reporting	315	\$50	\$15,750

**13. Estimate of Other Total Annual Cost Burden to Respondents or Record-Keepers**

There are no capital and start-up, operation, maintenance, and purchase costs associated with this information collection

**14. Annualized Costs to the Federal Government**

Total Costs (annual)

	\$	Comments
--	----	----------

Cost to NCSU		Reflects NCSU's contribution to this survey, which is 20% of the total.
Survey development	\$296	
Data collection	\$10,954	
Data analysis	\$531	
Report preparation	\$483	
NCSU subtotal		
Cost to ARS (Federal Gov.)	\$8,127	Based on the portion of the Specific Cooperative Agreement for this survey paid to NCSU and 10 hours of a GS 15 scientist.
Total	\$20,391	

**15. Explain the reasons for any program changes or adjustments reported in Items 13 or 14 of OMB Form 83-I.**

Not applicable

**16. For collections of information whose results are planned to be published, outline plans for tabulation and publication.**

We will begin the process of mailing the survey to farmers within 190 days of OMB approval and follow the following data collection schedule.

<b>Activity</b>	<b>Proposed dates</b>
1. The survey and cover letter will be mailed	January 09, 2012
2. Reminding postcards will be mailed to all participants thanking them for mailing the survey if they have and reminding others to mail the survey.	January 17, 2012
3. Second mailing of survey to nonrespondents will be made.	January 24, 2012
4. Reminding postcards will be mailed to nonrespondents for reminding to mail the survey.	January 31, 2012
5. Report preparation and publication of findings by NCSU	February. 01 to June.15, 2012

The NCSU cooperator and his graduate student will prepare an initial draft report of the data within 3 months of completing the survey and a final report of the results provided to

the ARS National Program leader for NP216 within six months of completing the survey. Manuscripts for professional publication and presentations at professional meetings will be prepared within nine months of completing the survey.

**17. If seeking approval to not display the expiration date for OMB approval of the information collection, explain the reasons that display would be inappropriate.**

We plan to display the expiration date for OMB approval of the information collection on all instruments.

**18. Explain each exception to the certification statement identified in Item 19 “Certification for Paperwork Reduction Act.”**

There are no exceptions to the certification statement.

## **B. Collections of Information Employing Statistical Methods**

The agency should be prepared to justify its decision not to use statistical methods in any case where such methods might reduce burden or improve accuracy of results. When Item 17 on the Form OMB 83-I is checked, "Yes," the following documentation should be included in the Supporting Statement to the extent that it applies to the methods proposed:

**1. Describe (including a numerical estimate) the potential respondent universe and any sampling or other respondent selection methods to be used. Data on the number of entities (e.g., establishments, State and local government units, households, or persons) in the universe covered by the collection and in the corresponding sample are to be provided in tabular form for the universe as a whole and for each of the strata in the proposed sample. Indicate expected response rates for the collection as a whole. If the collection had been conducted previously, include the actual response rate achieved during the last collection.**

The potential respondent universe of this survey includes the end-users of Agricultural Research Service developed technology in NP216 project implemented 18 states. That includes farmers and agricultural business customers in Alabama, Arkansas, Colorado, Georgia, Iowa, Maryland, Maine, Minnesota, Missouri, Mississippi, Montana, North Dakota, Nebraska, Oklahoma, Oregon, Pennsylvania, South Dakota, and Washington. Farmers in these 18 states who received payments from the USDA Farm Service Agency in 2008 comprised the accessible population. The table below indicates the number of farmers in the FSA database residing in each state. There **are 789,986 farmers in the population frame**. We will use proportionate random sampling procedure to draw our study sample from this population frame. Previous research reveals that response rate to mail surveys by farmers is low. Diekmann and Batte (2009) observed a 41.4% response rate for farmers in Ohio for a mail survey while English, Jensen and Menard (2005) reported 23.3% response rate for farmers in Tennessee for a mail survey. Based on this information we expect a 30% response rate by farmers in this survey. The following table is the total number of farmers by state in the population frame that we plan to draw the study sample.

Distribution of Study Population by State

<b>State</b>	<b>Number of Farmers</b>
<b>AL</b>	30644
<b>AR</b>	36333
<b>CO</b>	22072
<b>GA</b>	40366
<b>IA</b>	139636

<b>ME</b>	2215
<b>MD</b>	7077
<b>MN</b>	89979
<b>MS</b>	35056
<b>MO</b>	93271
<b>MT</b>	23812
<b>NE</b>	81891
<b>ND</b>	44928
<b>OK</b>	50052
<b>OR</b>	9297
<b>PA</b>	22735
<b>SD</b>	43745
<b>WA</b>	16877
<b>Total</b>	<b>789986</b>

**2. Describe the procedures for the collection of information including: Statistical methodology for stratification and sample selection, estimation procedure, degree of accuracy needed for the purpose described in the justification, unusual problems requiring specialized sampling procedures, and any use of periodic (less frequent than annual) data collection cycles to reduce burden.**

The study design and sampling scheme is described in more detail below. This is a mail survey conducted with randomly selected 5123 farmers from a population of all farmers receiving Farm Service Agency payments in 2009 and 2010. The database contained 2,252,097 names. We limited the universe of possible farmers to those in the states where NP216 programs exist (see the table above).

The Krejcie and Morgan (1970) sampling table was used for determining the sample size. The degree of accuracy selected is 95% confidence with a 2.5% margin of error for the estimated statistics. The Krejcie and Morgan (1970) table indicates that we need to survey 1,534 farmers from the population of 789,986 farmers for achieving this level of accuracy. Because we expect the farmer response rate to be 30% we need to increase the sample size from 1,534 to 5,113 to achieve the desired level of accuracy.

We use the following calculation for determining the sample needed to accommodate low response rate:

$$\text{Needed sample} = 1,534(100/30) = 5,113$$

Proportionate random sampling was used to draw 5,113 farmers from the population in 18 states. The rationale for the use of proportionate random sampling is to ensure the representation of farmers from all the states where NP216 scientists are located and focus their end-user technology transfer efforts. The SURVEYSELECT procedure of the Statistical Analysis System (SAS) Version 9.2 was used to draw the sample from the above described population frame and defined accuracy. The summary of the proportionate random sample drawn from the 18 states in the population frame is summarized in the following table:

State	Number of Farmers	Proportionate Random Sample
AL	30644	199
AR	36333	236
CO	22072	143
GA	40366	262
IA	139636	904
ME	2215	15
MD	7077	46
MN	89979	583
MS	35056	227
MO	93271	604
MT	23812	155
NE	81891	531
ND	44928	291
OK	50052	324
OR	9297	61
PA	22735	148
SD	43745	284
WA	16877	110
Total	789986	5123

This population frame contains mailing addresses and telephone numbers. The study will be conducted by mail and telephone numbers will be used for conducting a follow-up with nonrespondents.

**3. Describe methods to maximize response rates and to deal with issues of non-response. The accuracy and reliability of information collected must be shown to be adequate for intended uses. For collections based on sampling, a special justification**

**must be provided for any collection that will not yield "reliable" data that can be generalized to the universe studied.**

The study will be conducted only once and we plan to send the survey during the winter when farmers are less busy. This will help increase the response rate. We will mail the survey with a cover letter and stamped return addressed envelope. The cover letter will briefly describe the need for the survey and how the information will be used. One week after the mailing, if we do not receive adequate response rate, we will remind nonrespondents with a follow-up post card. After two weeks of the first mailing, we will send the survey to nonrespondents with a cover letter inviting them to complete the survey. One week after the second mailing of the survey, if we do not receive adequate response rate, we will remind nonrespondents with a follow-up post card. We will not use any other methods for collecting data.

A panel of extension experts was used to review the survey and established the content validity. The most significant factor contributing to the response rate is length of the survey. We limited the survey to six pages maximum. The survey was formatted to enable easy readability and most questions only require the participant to check their preference from a list. We have limited open ended questions to a bare minimum. We will include a cover letter explaining the purpose of the survey to secure the cooperation of respondents.

**4. Describe any tests of procedures or methods to be undertaken. Testing is encouraged as an effective means of refining collections of information to minimize burden and improve utility. Tests must be approved if they call for answers to identical questions from 10 or more respondents. A proposed test or set of test may be submitted for approval separately or in combination with the main collection of information.**

Because OMB has indicated that this has to be the final form of the survey, no further testing or adjustments will be made to the survey. We will not perform a pilot test of the survey with farmers.

**5. Provide the name and telephone number of individuals consulted on statistical aspects of the design and the name of the agency unit, contractor(s), grantee(s), or other person(s) who will actually collect and/or analyze the information for the agency.**

North Carolina State University Extension Evaluation Specialist, Dr. K. S. U. Jayaratne is responsible for collecting data, designing and conducting statistical analysis of the data. His graduate assistant Lauren Mouton provides needed assistance for this work. Their contact information:  
K. S. U. Jayaratne, Room 214, Ricks Hall, Department of Agricultural and Extension Education, North Carolina State University, Campus Box 7607, Raleigh, NC 27695.

Telephone: 919-515-6079

Lauren Mouton, Graduate Assistant, Room 207, Ricks Hall, Department of  
Agricultural and Extension Education, North Carolina State University, Campus  
Box 7607, Raleigh, NC 27695