

Imputation

A diversity of agricultural surveys being conducted by NASS provides a variety of missing data situations that range from missing information for the entire sampling unit to a missing portion of the desired information for the sampling unit. Development of consistent imputation procedures for multivariate and longitudinal survey situations is an area of research interest.

Survey Process Control

More emphasis is being placed on quality during the entire survey process—frame preparation, sample selection, training, data collection, data handling and editing, summarization, and analysis. Research into statistical methods that need to be applied across the entire survey process is part of this complex issue in survey sampling.

Nonsampling Error Research

The realm of nonsampling error is potentially present in sample surveys. NASS collects information by telephone, person, mail and web-based surveys, and field and laboratory counts and measurements. Statistical procedures that identify, control, and measure nonsampling error or measurement error are of interest to NASS. Nonresponse issues, such as analysis and reduction of nonresponse, and analysis of potential nonresponse bias are also of interest.

Sample Design and Estimation Research

Sample design topics include list frame; area frame; multiple frame; and objective yield designs for one-time, cross-sectional, spatial, and longitudinal situations. Estimation topics include direct expansion, ratio, Bayesian, small area, regression, robust, time series, and longitudinal estimators. NASS, as a leader in the use of calibration weighting to increase efficiency and adjust for unit nonresponse and undercoverage, is interested in developing statistically reliable evaluation tools for the products of this technique and in expanding its use, where appropriate.

Objective Yield Forecasting Methodology

Forecasting models are developed using historical survey relationships between early season plant and fruit characteristics and final plant and fruit yields. As the base survey design becomes more complex in the operational program of NASS, or the fruits or plants designated for the forecasting program change, estimation model parameters continually need research attention and evaluation. The estimation of mean square error components within this complex survey structure is a possible area of research.

New Technology and Methods

Research into computer and other technologies is part of the NASS research program. Areas of interest include the devel-

opment of artificial intelligence software and the use of tools such as data mining to evaluate multiple survey estimates and external sources of check data, expert systems to edit survey data, and geographic information systems to access spatial environmental data.

Remote Sensing

The application of the Earth resource and weather data satellite technology to agricultural estimation continues to intrigue. Efficient multivariate clustering and classification algorithms for very large datasets are of special interest, as are the creation and evaluation of vegetative indices.

Economic and Environmental Statistics

NASS conducts an annual economics statistics survey as part of its Agricultural Resources and Management Survey (ARMS). Environmental or farm chemical usage modules also are incorporated into ARMS. A detailed questionnaire is needed for each of the selected sample units. One area of research might be a survey design that uses both global and detail questionnaires to increase efficiency and reduce respondent burden. Another is the evaluation of (and possible improvement upon) randomization-based techniques in the estimation of model parameters with not-very-large samples.



Research Fellow & Associate Program



*American Statistical Association
U.S. Department of Agriculture
National Agricultural Statistics Service*

Research Fellow & Associate Program



This program allows selected Fellows and Associates the opportunity to engage in research of large-scale agricultural survey operations, including design, collection, quality control, forecasting, estimation, and analysis. Research takes place at NASS' Research and Development Division, 3251 Old Lee Highway, Fairfax, Virginia, so participants have access to extensive NASS data and staff interaction.

Fellowship program applicants should have:

A PhD

An established and recognized research record

Considerable expertise in their area of proposed research

Associate program applicants should have:

A PhD or at least two years of graduate study in an appropriate field

Applicants may request to work in a specific area or on a special problem, propose a broad area of learning, or seek an open program of research related to an area of expertise. All requests will be competitively evaluated by a panel of individuals from the ASA and NASS based on the proposal content, its applicability to NASS programs, and facilities and personnel available to assist in the proposed research. A research report is expected of participants upon completion of the program.

To assist research, NASS has actively maintained list and area sampling frames; survey design capability; computation and analysis capabilities using PCs and a mainframe network; and large-scale data collection capability. The organizational



structure of NASS features a large number of field offices capable of carrying out surveys utilizing an extensive corps of field and telephone enumerators. There are also a number of regularly scheduled surveys that provide vehicles for evaluating single- or multiple-frame methodologies.

All participants are reimbursed by the ASA and are on a cooperative work arrangement with NASS. Fellow's stipends are commensurate with current faculty salary and include an appropriate moving and travel allowance. There is the possibility of an arrangement under the Inter-Government Personnel Act, where the stipend supplements an existing sabbatical; however, the selection will not depend on this arrangement. Associates' stipends are set at the equivalent GS rating, depending on academic and other background, and include a moving and travel allowance.

Positions typically are an academic year of 9–12 months. They may be extended up to one additional year under special circumstances. Special appointments covering one or several shorter periods of 2–3 months also will be considered.



Research Fellow & Associate Program

Contact

Questions about the NASS program may be directed to **Wendy Barboza**

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Send Application

Applications should be sent **electronically** in one PDF file to joyce@amstat.org.

Possible Statistical Survey Methodology Topics

Areas of current interest are outlined for the following 11 topics concerning surveys at the U.S. Department of Agriculture–NASS. Applicants are encouraged to propose other areas that may be of interest.

Statistical Survey Methodology

NASS personnel actively maintain a list-sampling frame containing known operators of farms and agribusinesses. The list frame also has various measures of size capacity with the sampling units. Multiple-frame methodology demands the use of an independent area frame to estimate for the list undercoverage. Therefore, a stratified and independent area frame based on land use also is maintained by NASS. The use of a single frame or multiple frames involves sampling design and various kinds of nonsampling errors, which need to be evaluated. Research in the efficient use of these frames is ongoing.

Questionnaire Design

Data collection within the operational NASS program involves telephone, personal, and self-administered interviews (both paper-and-pencil and web-based). Questionnaire design will vary by method of collection. Approaches for developing and testing questionnaires, including cognitive methods that may lead to improved efficiency or accuracy, are of interest.

Computer-Assisted Survey Methods

NASS has implemented computer-assisted data collection into its operational program. Computer-assisted telephone interview influences on the quality of data collected online, and many other data quality issues are of interest to NASS. In addition, research is needed on the use of computer-assisted personal interviewing, the use of computers in self-administered questionnaires, and associated interactive data entry and editing activities.