SUPPORTING STATEMENT - PART B for

OMB Control Number 0535-0088:

Objective Yield Surveys

ICR Author: Struther Van Horn

USDA, National Agricultural Statistics Service

1400 Independence Avenue S.W.

Washington, D.C. 20250

Supporting Statement B

OBJECTIVE YIELD SURVEYS

OMB No. 0535-0088

B. COLLECTION OF INFORMATION EMPLOYING STATISTICAL METHODS

1. Describe (including a numerical estimate) the potential respondent universe and any sampling or other respondent selection method 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 has been conducted previously, include the actual response rate achieved during the last collection.

The Soybean, Corn, and Cotton Objective Yield (OY) Sampling Frames are established using operations that have reported acreage for these crops. Typically, this data is sourced from the June Area Survey. However, depending on specific operational requirements and data availability, the June Agricultural Production Survey (APS) may also be utilized to define these sampling frames. The Wheat OY Sampling Frame comprises operations that reported wheat acreage on the March Agricultural Survey. Sample sizes are determined using target CVs and previous survey data. Samples are selected using a probability proportional to size (PPS) sample design.

The 2025 U.S. planted and harvested acres, number of sampled OY units, and survey completion rates for the Field Crop OY Survey - Form A, by crop, are exhibited below.

Table B.1.a Projected Counts and Actual Completion Rates, Form A, By Crop

Survey Crop	Sampling Frame	No. of States	Questionnaires	2025 Allocation			2025 Completion Rate%
			ID Numbers	Planted Acres (000)	Harvested Acres (000)	No. of Sample Units	
Corn	Area	10	120032 A, B, C-1, C-2, E	98,788	91,258	1158	65
Soybeans	Area	11	120034 A, B, C-2, C-2R, E, R	81,215	80,437	1528	69
Wheat	Area & List	10	120031 A, B, C-1, C-2, E	33,153	25,508	1154	72
Totals				213,156	197,203	3,840	69

The completion rate for the Field Crop OY Survey - Form A is calculated as follows:

Completion rate = a / (n – p)

Where;
a is the number of complete Form As and any field observations.
n is the number of selected sample units
p is the number of selected sample units that did not have a crop or targeted crop or the field was plowed or abandoned.

The respondent is only interviewed when the first questionnaire (Form A) is administered; therefore, respondent burden only occurs during this visit. During this interview, the sample field is verified and permission for the enumerator to enter the sample field to set up sample units for collecting plant data is requested. On subsequent farm visits, the enumerator will collect plant data, via Form B, from the sample units. Below are the 2025 completion rates by month and crop.

	Wheat	**Corn**	**Soybeans**
May	38		
June	69		
July	71		
Aug	72		
Sept	72	58	58
Oct		Govt. Shutdown	Govt. Shutdown
Nov		Govt. Shutdown	Govt. Shutdown
Dec		65	69
Jan			

Respondents to the Tree Fruit Objective Yield Survey will be selected from databases with field level data on crop, variety, age of tree, and bearing status. The databases are updated annually using the

- California Fruit Acreage Survey (OMB No. 0535-0039),
- Florida Commercial Tree Inventory Survey that will utilize aerial photography and verification by Florida Department of Agriculture and Consumer Services (FDACS) staff, as well as
- Industry provided plantings by year and design using GIS data.

	CA Navel OM [1/]	CA Valencia OM	CA Walnut OM	FL Citrus OM
June				
July				
Aug	94		92	100
Sept				100
Oct				100
Nov				100
Dec				100
Jan		95		100
Feb				100
March				100

1/ Includes Mandarin & Cara Cara Varieties

The response rate for the Florida Citrus OM Survey is 100 percent.

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

Field Crops

Field Crop OY surveys are conducted in major producing States for corn, cotton, soybeans, and winter wheat. For each commodity, a series of monthly yield forecasts culminates in a final estimated yield at maturity.

Acreage, yield, and production monthly forecasts from Objective Yield surveys are made from May to August for winter wheat, from September to November for corn and soybeans, and from September through January for cotton.

Forecasts and estimates, based on data obtained from the OY surveys as well as NASS's base agricultural surveys (OMB No. 0535-0213), are published in the monthly *Crop Production* reports.

For corn, cotton, and soybeans, the sampling universe is defined by all acres identified as being planted to the target commodity. When the June Area Survey is utilized, this universe comprises acres identified within that survey. The June Area Survey itself is sampled from NASS' Area Frame, where each state's complete land area is divided into segments. After segments are randomly selected, enumerators are dispatched to account for all land within

these segments, identifying agricultural activity, demarcating individual tract boundaries (unique operating arrangements within the segment boundary), and calculating their acreages. Subsequently, sample fields for the Objective Yield surveys are randomly selected from within these identified tracts. In cases where the June Agricultural Production Survey (APS) is employed, the sampling universe would be derived from acres reported in that survey. For wheat, the sampling is done at the operation level. The sample is drawn from all operations reporting in the March Agricultural Survey as having planted or intending to plant wheat for harvest as grain. The March Agricultural Survey makes use of a Multiple Frame made up of NASS's list of producers (List Frame) and producers identified by the Area Frame.

For all four commodities, samples are selected with probability proportional to size (PPS), resulting in a self-weighting sample of areas for the commodity of interest in each State. The granularity of available survey data dictates the level of sample selection. For corn, cotton, and soybeans, when using data from the Area Frame, sample selection is possible at the tract level. However, if the June Agricultural Production Survey (APS) is utilized for these commodities, the data is collected at the farm level, similar to the farm-level data collected for winter wheat in the March Agricultural Survey. Tracts or farms with large acreage or expansion factors may be selected for more than one sample.

The major goal of the OY program is to produce indications of expected yield and final harvest yield using actual plant counts and measurements. OY indications calculated from actual plant counts and measurements eliminate some of the biases found in the farmer reported yields from other surveys.

The OY surveys produce indications for harvested acres, yield, and production. Objective measurements (counts of plants, ears, pods, bolls, etc.) are made on small plots of land. At maturity, the small plots are harvested, and yield is calculated based on the actual production taken from these small plots.

OY surveys collect data at different times during the growing season. During the initial OY interview (Form A), the operator is asked to verify the acreage reported on the parent survey. This is done on a field-by-field basis. The main purpose is to verify the sub-sampling frame by checking the acreage reported on the parent survey and recording any changes. Changes may be due to recording or reporting errors in the parent survey, failure to fulfill planting intentions, or switching to other utilizations. Only total farm winter wheat acres were asked on the base survey(s). Therefore, farmers are asked to report individual fields of winter wheat during the initial interview. Other data that must be obtained from the operator are collected at this time: planting date, planter row width, seeding practices, irrigation use, and application of pesticides. Enumerators ask for permission to enter the

sample field to make counts and measurements on subsequent visits. For more information on NASS's Objective Yield Sample Design, please reference Chapter 2, pages 4-9 of "The Yield Forecasting Program of NASS." (Attached in the ROCIS submission system)

Ratio indications comparing the initial interview acres to the parent survey are computed to determine if acreage revisions are in order. The planting date gives an indication of harvesting date so enumerators are aware of when the final pre-harvest field visit will occur. Enumerators use the planter row width as an indicator of when the sample plots will be laid out. For example, narrow row soybean sample units are laid out as early as possible to limit the amount of destruction which can occur to the plants. When analyzing the data, the use of biological pest controls such as Bacillus thuringiensis (Bt) seed, herbicide resistant plant varieties, or irrigation are taken into consideration. Enumerators ask about applications of pesticides for data collection safety reasons since they will be handling the live plants.

Two units are laid out for each sample. The units are located and laid out according to specific procedures to assure randomness in field location. Plant and fruit counts, fruit measurements, and maturity determinations are recorded each month using the Form B until the crop is mature or harvested. Early season data are entered into regression equations used to forecast gross yield and the components of yield--number of fruit and weight per fruit. At maturity, the final visit obtains crop cutting data used to directly calculate final gross yield. The counts and measurements from all visits are added to the historical database used to derive future forecast equations.

Regional laboratories record measurements of fruit on the Form C. Lab samples are submitted for every sample hand-harvested by field enumerators. Lab measurements include weighing the fruit (ears, pods, bolls, heads, or tubers), weighing the grain after threshing, and determining moisture content. These data are obtained in a controlled environment. The data are used to calculate a threshing fraction and adjust to standard moisture. For wheat, labs count spikelets and grain from "green" heads early in the season which are used to forecast grain weight per head.

After the farmer has harvested the sample field, post-harvest gleaning data are collected on the Form E. All unharvested fruit and loose grains are gleaned from plots laid out after harvest in a subset of the sample fields. The gleanings are sent to the regional labs where they are weighed and tested for moisture. Harvest loss computed from these data is deducted from estimates of gross yield (calculated from Form B) to arrive at a net yield. During pre-harvest forecasting, historical average harvest loss is used.

A series of equations are used in forecasting the components of yield. In the case of wheat for example, the two components are weight of grain per head

and number of heads for each sample. These regression equations utilize current monthly counts and measurements as the independent variables.

Linear regression equations relate historic number of plants per unit to number of plants at the end of the season. The correlation coefficient provides a measure of the relative effectiveness of the models and is used to weight equations together. For more information on this topic, please reference Chapter 4, pages 20-27 in “The Yield Forecasting Program of NASS” (attached).

The OY survey data are found to be reliable predictors of actual yield. In 2025 the coefficient of variation produced from models using data from the OY survey ranged from 1.4 to 9.6 percent in the major States, across all observed crops. When these major States are grouped together, the coefficient of variation is further reduced to 1 to 2 percent on average, across all participating States and all observed crops, which is considered a very reliable indicator of yield.

Fruits and Nuts

Fruit and Nut Objective Yield (OY) surveys will be conducted in major producing States for citrus and walnuts when funding is available from cooperators. For each of these commodities except citrus in Florida, there is only one objective yield forecast: the final net yield at maturity. Florida citrus will utilize a series of net yield forecasts during the growing season.

Forecasts of acreage, yield, and production will be made in October, January, and April for citrus in Florida. One-time forecasts of acreage, yield and production will be made in:

- March for Valencia oranges and Clementines in California,
- September for navel oranges, Mandarins, and walnuts in California

These forecasts and estimates, based on data obtained from the Objective Yield Surveys, will be published in a release published jointly by NASS and the cooperator.

Sample fields for citrus and walnut objective yield surveys will be selected from databases with field level data on crop, variety, age of tree, and bearing status. All bearing age trees are assumed to be available for harvest. The databases will be updated using the:

- California Fruit Acreage Survey (OMB No. 0535-0039),
- Florida Commercial Tree Inventory Survey that utilizes aerial photography and verification by FDACS staff, as well as
- Data provided by the hazelnut industry with plantings by year and design using Geographic Information System (GIS) data.

The sample fields for all tree fruit crops will be selected with probability proportional to size (PPS) and the net effect is a self-weighting sample of areas with the crop of interest in each State. The detail of the fruit acreage databases will allow sample selection at the field level for citrus and tree nuts. Fields with large acreage or expansion factors may be selected for more than one sample. Separate trees and terminal branches will be selected and marked for each sample within a field up to four samples per field.

The major goal of the tree fruit OY program is to produce indications of expected yield and final production using actual plant counts and measurements. OY indications calculated from actual fruit counts and measurements are free from some of the biases found in farmer reported yields from other surveys.

The OY surveys will produce indications for harvested acres, yield, and production. Objective measurements on fruit count and fruit size (for citrus fruits) will be made on a terminal branch (two terminal branches in California) of a selected tree. At maturity, fruit from the selected branch will be harvested and yield will be calculated based on the actual production taken from these terminal branches, less an allowance for harvest loss.

The tree fruit OY surveys will collect data at one time prior to harvest. The proposed forecast dates and usual harvest periods are summarized in the table below:

Forecast Date and Usual Harvesting Period by Commodity		
Commodity	**Forecast Date**	**Usual Harvest Period**
Citrus: Valencia – California	March	June – July
Citrus: Clementines – California	March	June – July
Citrus: Navel – California 1/	September	January – April
Citrus: Mandarins – California	September	January – April
Walnuts – California	September	Late September – January

1/ Includes cara cara varieties

During the OY interview (Permission Form, Form A), the operator will be asked to verify the acreage, variety, year planted, and plant spacing recorded on the fruit acreage database. This will be done for the selected block. Updates may be due to recording or reporting errors in the acreage survey, or other reasons. Enumerators ask for permission to enter the sample field and make counts and measurements, as well as obtain a sample of fruit from the terminal branch.

Chapter 601.29(2), Florida Statutes, the Florida Citrus Code authorizes site visits to the State's commercial groves for objective fruit measurements and counts. Initial phone calls will be made prior to each visit to announce the visit and to obtain information about dogs on the property or spraying.

Ratio indications of the initial interview acres to acres reported on the parent survey are computed to determine if acreage revisions are in order. Enumerators ask about applications of pesticides for safety reasons, since they will be handling the live plants in the field.

Two trees will be selected for each sample. In Florida, one terminal branch will be marked for each tree. In California, two terminal branches will be marked for each tree. The terminal branches will be located and marked

according to specific procedures to assure randomness in field location and branches on the selected tree. Fruit counts, fruit measurements, and maturity determinations will be recorded during each collection using the size card and measurements on Form C. In Florida, data are entered into regression equations used to forecast gross yield and the components of yield: number of fruit and weight per fruit. The counts and measurements from all visits are added to the historical database used to derive future forecast equations. In California, average fruit per tree and fruit size measurements are calculated. These variables along with bearing acres, trees per acre, are used in regression equations to forecast total production.

Regional laboratories record measurements of fruit on the Form C or size card. Lab samples are submitted for every sample hand-harvested by field enumerators. Lab measurements for walnuts will include weighing as well as recording the length, width, cross-width, and weight of the fruit. These data will be obtained in a controlled environment.

A series of equations will be used in forecasting the components of yield based on fruit count, size, and weight. Linear regression equations relate historic number of fruit per terminal branch to number of plants at the end of the season.

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 National Association of State Departments of Agriculture (NASDA), under a cooperative agreement with NASS, hires and helps NASS train quality field enumerators. The Florida Department of Agriculture and Consumer Services (FDACS) will hire and help NASS train quality field enumerators and analysts for the Florida Citrus Objective Yield program. The majority of the field enumerators come from rural or agricultural backgrounds. They are aware of many of the complexities of the farming industry and the importance of having accurate and timely data when making operating decisions. Many of the field enumerators have been collecting data for NASS for multiple years. Most of the field supervisors have been collecting data for NASS for over 20 years.

In addition to their experience in the farming industry and in prior data collections, enumerators receive rigorous initial and on-going interviewer training from NASS and NASDA/FDACS. Specifically, Objective Yield enumerators attend State training workshops in which field procedures, measurement techniques, and interview skills are reviewed. Enumerators

also learn how the survey information is used, which enables them to communicate the purposes and use of survey data to potential survey participants. All enumerator procedures are subject to quality control review in order to keep non-sampling errors at a minimum.

To maximize response rates, NASS tries to utilize the same enumerators across all field enumerated surveys. This helps farm operators to become accustomed to providing data to the same enumerator on a regular basis.

4. Describe any tests of procedures or methods to be undertaken.

No tests of procedures or methods are planned.

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), or other person(s) who will actually collect and/or analyze the information for the agency.

Survey design and methodology are determined by the Summary, Estimation, and Disclosure Methodology Branch, Methodology Division; Branch Chief is Lindsay Drunasky. Lindsay's email is lindsay.drunasky@usda.gov and phone number is (202) 690-8141.

Sample sizes for each State are determined by the Sampling, Editing, and Imputation Methodology Branch, Methods Division; Branch Chief is Adam Cline. Adam's email is adam.cline@usda.gov and phone number is (202) 531-6010.

The NASS survey administration, data collection, estimation, and publication are carried out by NASS Regional Field Offices; Western and Acting Eastern Field Operation's Director is King Whetstone. King's email is king.whetstone@usda.gov and phone number is (202) 720-9567. The survey administrators are responsible for coordination of sampling, questionnaires, documentation, training, and data processing.

The NASS survey administrators in Headquarters of the Survey Administration Branch, Census and Survey Division; Branch Chief is Patrick Boyle. Patrick's email is patrick.boyle@usda.gov. and phone number is (701) 212-8681. The survey administrators are responsible for coordination of sampling, questionnaires, data collection, training, Interviewer's Manuals, Survey Administration Manuals, data processing, and other Regional Office support.