Grain Stocks Methodology and Quality Measures

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Scope and Purpose: Estimates of grain stocks and capacity are derived from the Agricultural Survey and the Off-Farm Grain Stocks (OFGS) survey. The Agricultural Survey is a quarterly survey (March, June, September, and December) conducted in all States, except Hawaii, which collects on-farm grain stocks and storage each quarter. Reports received from individual farmers and ranchers remain confidential and are used only in combination with other reports to arrive at State and National estimates. The OFGS survey is conducted quarterly in all States, except Alaska, Connecticut, Hawaii, Nevada, and Rhode Island. For the OFGS survey, elevators, warehouses, and processing facilities are contacted to determine how much of a commodity is being stored at a certain point in time. Published estimates for the off-farm grain stocks are used in combination with the on-farm grain stocks estimates to get a complete picture of the amount of grain stored across the country.

The use of crop acreage, production, and stocks information is extensive and varied. It helps producers find the best market opportunities for their commodities. Often, recommendations and forecasts presented in agricultural magazines, news releases, etc. are based on data from the Agricultural Survey and the OFGS surveys found in NASS reports. Uses of data by farm organizations, financial institutions, insurance companies, agribusinesses, State and National farm policy makers, and buyers of agricultural products may range from maintaining a basic data series to preparing marketing campaigns and determining needs and rates on farm loans and insurance policies. Government agencies at various levels are important users of statistics. Federal farm programs require information on acreage, production potential, stocks, prices, and income. Agricultural statistics are used to plan and administer Federal and State programs in areas such as consumer protection, conservation, foreign trade, education, and recreation.

Timeline: The reference date for the stocks portion of both surveys is the first of the month (March, June, September, and December) with a data collection period of approximately 15 calendar days. Regional Field Offices (RFOs) may begin data collection two days prior to the reference date. Data collection continues until a scheduled ending date, and RFOs have about 4 or 5 business days to complete editing and analysis, execute the summary, and interpret the survey results. The Agricultural Statistics Board (ASB) conducts the National review, reconciles State estimates to the National estimates, and prepare the official estimates for release in 5 or 6 business days. The Grain Stocks report is released at the end of each specified month above except for December. The December 1 stocks estimates are published in early January. The publication contains quarterly U.S. and State level data for grain stocks for all wheat, barley, corn, Durum wheat, oats, sorghum, and soybeans. Certain months of the publication contain annual grain stocks data for canola, mustard seed, rapeseed, rye, and safflower. Additionally, biannual grain stocks data are published for chickpeas, dry edible peas, and lentils in June and December, and for sunflower in March and September.

Sampling: The target population for the Agricultural Survey is farms with cropland and/or storage capacity. NASS uses a dual frame approach, consisting of list frame and area frame components, to provide complete coverage of this target population.

The list frame includes all known farms. Crop acreages and storage capacity of each farm is maintained on the list frame to allow NASS to define list frame sampling populations for specific surveys and to employ efficient sampling designs. Only list frame records with positive planted acres or storage capacity of the desired commodities are included in the list frame population. A lower boundary, such as 50 acres of total cropland or 1,000 bushels of grain storage capacity, is used for some States to establish the list frame population.

The area frame contains all land in the State and, as such, is complete. The land is stratified according to intensity of agriculture using satellite imagery and sampled to effectively measure crops and livestock. All sampled land areas are

enumerated in June. The farms found operating in these segments are checked to see if they are included in the list frame population. The farms that are not included in the list frame sampling population are sub-sampled for the March, September, and December surveys so that the target population is completely represented. These farms are referred to as the nonoverlap portion of the area frame (NOL). The area frame portion of the Agricultural Survey sample is selected from the NOL using a stratified sample design based on data collected in the June Area Survey. A final sampling weight is assigned to each area frame sampling unit which is used to create the survey estimates.

The Agricultural Survey list frame sample is selected using a multivariate probability proportional to size (MPPS) sampling scheme. Each list frame record is assigned a measure of size based on the control data for multiple specified commodities. The MPPS design makes it very easy to target sample sizes for the commodities of interest, and it is a more efficient design because farms will have a more optimal probability of selection based upon their individual commodities and size. A replication scheme is used to reduce respondent burden and to provide indications of change by comparing reports from the same farm operators. Specific replicates are designated as a stocks panel to accurately measure change in stocks from quarter to quarter.

After the list frame samples are drawn, the sample weights are calibrated so the sum of the weighted commodities in the sample equals the sum of the list frame data for the targeted commodities for each quarter. For example, the sum of the weighted list frame data for storage capacity equals the sum of the population list frame data and is the same for each of the four quarters. All list frame records in the sample are grouped into strata based on the amount of cropland and capacity they have on the list frame. These strata are only used for nonresponse adjustments.

For each commodity, target coefficients of variation (CVs) are determined in advance of sampling to provide a certain level of precision for the stocks estimates. The CV is defined as the ratio of the standard error to the estimate expressed as a percentage. At the U.S. level, these target CVs range from 2% to 4% for corn, from 2% to 5% for soybeans, and from 3% to 4% for all wheat stocks depending which quarter of the marketing year the survey occurs. As on-farm stocks become scarce toward the end of the marketing year, the CVs of the stocks estimates generally increase. However, the standard errors also become smaller as stock levels decline across the marketing year. Each year, the final survey CVs are examined against the target CVs to see if any modifications to the sampling procedures are needed. CVs at the State level are expected to be higher than the U.S. level estimates due to the smaller sample sizes, and State level target CVs are set accordingly. Over the last decade, the U.S. level survey CVs have ranged from 1.5% to 4.5% for corn stocks, from 2% to 11% for soybean stocks, and from 2% to 5% for all wheat stocks.

The OFGS target population is all entities in the United States that store at least 1,000 bushels of grain (excluding peanuts and rice) off the farm. The OFGS sampling frame comprises all active operations – elevators, grain and oilseed processing plants, terminals, and other facilities that store grain or oilseeds (excluding peanuts and rice) - on NASS's List Frame that have at least 1,000 bushels of off farm grain storage capacity. The OFGS sampling frame is grouped into specialty and non-specialty operations and stratified using off farm grain storage capacity as a measure of size. The OFGS is a census; hence, stratification is only used for nonresponse adjustments.

Data Collection: For consistency across modes, the paper version is considered the master questionnaire and the web, Computer Assisted Personal Interview (CAPI), and Computer Assisted Telephone Interview (CATI) instruments are built to model the paper instrument. Questionnaire content and format are evaluated annually through a specifications process where requests for changes are evaluated and approved or disapproved. Input may vary from question wording or formatting to a program change involving the deletion or modification of current questions or addition of new ones. If there are significant changes to either the content or format proposed, a NASS survey methodologist will pre-test the changes for usability. Prior to the start of data collection, all modes of instruments are reviewed and web, CAPI, and CATI instruments are thoroughly tested.

All federal data collections require approval by the Office of Management and Budget (OMB). NASS must document the public need for the data, apply sound statistical practice, prove the data does not already exist elsewhere, and ensure the public is not excessively burdened. The questionnaires must display an active OMB number that gives NASS the authority to conduct the survey, a statement of the purpose of the survey and the use of the data being collected, a response burden statement that gives an estimate of the time required to complete the form, a confidentiality statement

that the respondent's information will be protected from disclosure, and a statement saying that response to the survey is voluntary and not required by law.

In addition to asking the specific storage capacity and stocks questions, all instruments collect information to verify the sampled unit, determine any changes in the name or address, identify any partners to detect possible duplication, verify the farm still qualifies for the target population, and identify any additional operations operated by the sampled operator.

Sampled farms and ranches receive a cover letter with the questionnaire mailing explaining the survey and providing instructions for completing the survey on the internet. The letter also notifies them that they will be contacted for survey purposes only if they do not return the questionnaire or complete the survey on the web. All modes of data collection are utilized for each survey. While mail and web data collection are the least costly methods of data collection, the short data collection period and the uncertainty of postal delivery times limits the effectiveness of collecting data by mail. Most of the data are collected by CATI in one of the five Data Collection Centers. Limited personal interviewing may be done, generally for large operations or those with special handling arrangements. A coordination tool is available to determine if any sampled farms are in multiple on-going surveys, so data collection can be coordinated.

OFGS Headquarter operations have the option of reporting for each elevator under their control or reporting total levels for each State in which they operate. If a firm chooses to report for each elevator, they complete a separate report for each elevator. If an operation chooses to report State totals, a report is completed for each State. Headquarter reports often account for many individual elevators in a State. The tables on pages 11-14 of this report reflect the counts of reporting units not the counts of individual elevators.

Survey Edit: As survey data are collected and captured, data are edited for consistency and reasonableness using automated systems. The edit logic ensures the coding of administrative data follows the methodological rules associated with the survey design. Relationships between data items (i.e. responses to individual questions) on the current survey are verified. Some data items in the current survey are compared to data items from earlier surveys to ensure certain relationships are logical. The edit assigns a status to each record, indicating whether the record passes or fails the edit requirements for consistency and reasonableness. Records that fail edit requirements must be updated or must be certified by an analyst to be exempt from the failed edit requirement. All records must pass edit requirements, or be certified exempt, before further analysis and summary.

Analysis Tools: Edited data from both surveys are processed and analyzed separately through standard interactive analysis tools which display data for all reports by item. The tools provide scatter plots, tables, charts, and special tabulations that allow the analyst to compare record level data with previously reported data for the same record and reported data from similar records. Atypical responses, unusual data relationships, and statistical outliers for all items are revealed by the analysis tool. RFO and Headquarters staff review such relationships to determine if they are correct. Data found to be in error are corrected, while accepted data are retained.

Nonsampling Errors: Nonsampling error is present in any survey process. This error includes reporting, recording, and editing errors, as well as nonresponse error. Steps are taken to minimize the impact of these errors, such as questionnaire testing, comprehensive interviewer training, validation and verification of processing systems, application of detailed computer edits, and evaluation of the data via the analysis tool. The respondent pool is monitored and reviewed during and after data collection, and data collection strategies modified where necessary, to continually minimize nonresponse error.

Estimators: Response to both surveys is voluntary. Some producers refuse to participate in the survey. Others cannot be located during the data collection period and some submit incomplete reports. These nonrespondents must be accounted for if accurate estimates of stocks are to be made. For the Agricultural Survey, nonrespondents are accounted for by imputing data where there are missing values.

The imputation program imputes for missing survey data using reported survey data and list frame data from "similar" reports with complete data. The algorithm defines "imputation groups" as Agricultural Statistics Districts (ASD) and within the strata assigned at the time of sampling. Operations in the strata with the most capacity and cropland do not

form homogeneous groups and are not eligible for machine imputation. If multiple follow ups do not produce a response, RFO statisticians are required to manually impute.

For all other strata the algorithm will first impute capacity for the nonrespondent. When available, previously reported capacity is used. Otherwise, the ratio of current survey capacity to the list frame data value for capacity is calculated from the respondents in an imputation group. This ratio is applied to the nonrespondent's frame capacity to derive the imputed value for the current survey. Missing stocks are imputed similarly using the respondents' ratio of stocks to capacity within each imputation group. An imputation group must have five or more respondents before it is used. Those with insufficient response are collapsed across ASD and, if there is still insufficient response, collapsed with adjacent strata.

Two kinds of estimators are used for stocks in the Agricultural Survey: direct expansions and ratio estimators. Direct expansions are used to estimate totals such as total capacity and stocks. For the list frame, direct expansions are calculated by summing the reported and imputed commodity values multiplied by the original sample weights. For the NOL sample, the direct expansion is calculated by summing the total farm data for each tract operation multiplied by the original sample weights adjusted for the proportion of the operation's total farmland found in the area sample. The multiple frame direct expansion is the sum of the direct expansions from the list frame and the area frame NOL component. Variances and CVs are calculated using non-imputed data only for the direct expansions to measure the precision of the stocks estimates. U.S. level CVs from the Agricultural Survey for the last eight quarters are displayed in the table on page 15 of this report.

The ratio estimator takes the form of a ratio of two direct expansions which are calculated by summing over the total sample (list + NOL), the reported commodity values multiplied by the original sample weights adjusted for usability status. The ratio estimator is used for all within and across-survey ratios (e.g. Current to Previous Stocks, Stocks to Production, and Stocks to Capacity). This estimator relies exclusively on reported data. For the survey to survey ratios, both the current and previous survey data must be reported or estimated to be included in the ratio. If either of these components is not complete, the sampling unit is excluded from the estimate and the weights of the complete records are adjusted accordingly.

The reweighting of the record level sample weight is made within the strata. The adjustment is calculated by summing the weights for all sample records within the strata and dividing by the sum of the weights from the usable records. This ratio is applied to the weights of the usable records. This adjustment assumes that the data of the nonrespondents are similar to the data of the respondents. CVs are also calculated for any ratio estimates in the summary. One advantage of the ratio estimator is that the CVs tend to be smaller than those for the direct expansions.

For the OFGS survey, an estimator that uses capacity information is used to calculate the direct expansion for total stocks. The estimator calculates a nonresponse adjustment by summing the capacity values for all reports and dividing by the sum of the capacity values for the usable operations in the lower strata. Operations in the higher strata must be manually imputed to account for any nonresponse. Any errors that may arise from manually imputing records are not captured in the calculated CVs.

The calculated CVs capture the relative uncertainty that originates from sampling the target population and the loss of sample from nonresponse. However, the CVs do not capture the effect of possible reporting errors or errors that may arise from nonrespondents making fundamentally different grain storing decisions than respondents within imputation or nonresponse adjustment groups.

Estimation: When all samples are accounted for, all responses fully edited, and the analysis material is reviewed, each RFO executes the summary for their States for each survey. When all RFOs have run summaries, Headquarters executes the National summary. Since all States conduct identical surveys, the samples can be pooled, and National survey results computed. The summary results provide multiple point estimates and corresponding standard errors for each data series being estimated. It also provides information used to assess the performance of the current survey and evaluate the quality of the survey results, such as strata level expansions, response rates, and percent of the expansion from usable reports.

RFO staff are responsible for performing a detailed review of their survey results. Any irregularities revealed by the summary must be investigated and, if necessary, resolved. Using the historical relationship of the survey results to the

official estimate, RFO staff must interpret the survey results and submit a recommended estimate to Headquarters for any commodity produced in their States that contributes to the published National estimate. The data are viewed in tabular and graphical form and a consensus estimate is established. RFO staff see their survey results only and do not have access to other States' results. For some data series, information from other sources (administrative data) is also utilized in the process of establishing estimates.

For the National estimates, NASS assembles a panel of statisticians to serve as the ASB which reviews the National results and establishes the National estimates. Since larger sample sizes yield more precise results, NASS employs the "top-down" approach by determining the National estimates first and reconciling the State estimates to the National estimate. The ASB has the advantage of being able to examine results across States, compare the State recommendations, and utilize administrative data available only at the U.S. level. The same estimators used in the State summaries are produced by the National summary. The ASB follows the same approach as the States in determining the National estimate. The historical relationship of the survey results to the official estimate is evaluated over time to determine accuracy and bias using tables and graphs. Each ASB member completes an independent interpretation of the survey results which are shared with the other members. Differing conclusions are discussed and members must explain the logic behind their estimate. An official National estimate is established only upon ASB consensus. Often the State recommendations do not sum to the National estimate. ASB members must reexamine the State results and adjust some States to make the sum of the estimates agree with the National estimate.

External information (administrative data) is also utilized in this process. To be considered, these data must be deemed to be reliable and come from unbiased sources. The most common administrative data for grain stocks are the outstanding loan data from USDA's Farm Service Agency.

For grain stocks, NASS employs a balance sheet approach to corroborate the survey results and official estimates. After estimates are made for on-farm and off-farm stocks, the totals of these two are combined and evaluated using the balance sheet. This method utilizes external information to check the reasonableness of the stocks estimates. This external data will vary some by crop, but includes imports and disappearance data for exports, food use (such as soybeans crushed), feed use, seed use, and industrial use (such as corn processed to produce ethanol and other by-products). This approach is typically limited to National level estimates.

Estimates are open to revision on a preannounced schedule only if new information becomes available. On-farm and off-farm stocks are subject to revision the quarter following initial publication and again in the following December 1 *Grain Stocks* report published in January each year. Every five years, estimates will also be reviewed following the Census of Agriculture, which is an exhaustive data collection effort of all known farm operations across the U.S. The information gathered from the Census of Agriculture provides the last chance for revision.

Quality Metrics for Grain Stocks

Purpose and Definitions: Under the guidance of the Statistical Policy Office of the Office of Management and Budget (OMB), the United States Department of Agriculture's National Agricultural Statistics Service (NASS) provides data users with quality metrics for its published data series. The metrics tables below describe the performance data for all surveys contributing to the publication. The accuracy of data products may be evaluated through sampling and nonsampling error. There is no sampling error present for the OFGS survey since it is a census of all known grain storage entities. The Agricultural Survey CVs measure the error due to sampling as well as some nonsampling error. Nonsampling error is also evaluated by examining response rates and the weighted item response rates.

> **Sample size** is the number of observations selected from the population to represent a characteristic of the population. Operations that did not have the item of interest or were out of business at the time of data collection have been excluded.

> **Response rate** is the proportion of the above sample that completed the survey. This calculation follows Guideline 3.2.2 of the OMB Standards and Guidelines for Statistical Surveys (September 2006).

> **Weighted item response rate** is a ratio of reported survey data expanded by the original sampling weight compared to final nonresponse adjusted summary totals.

> **Coefficient of variation** provides a measure of the size for the standard error relative to the point estimate and is used to measure the precision of the results of a survey estimator.

March Agricultural Survey Sample Size and Response Rate - States and United States: 2019 and 2020

State	Sample Size		Response Rate	
	2019	2020	2019	2020
	(number)	(number)	(percent)	(percent)
Alabama	830	815	70.1	56.0
Alaska	(NA)	114	(NA)	55.3
Arizona	377	422	74.3	63.5
Arkansas	1,766	1,702	65.2	66.0
California	2,343	2,278	53.4	51.4
Colorado	1,923	1,955	47.4	50.0
Connecticut	286	281	53.5	50.5
Delaware	388	402	45.4	41.0
Florida	611	658	54.3	55.9
Georgia	1,343	1,394	56.5	54.6
Idaho	1,752	1,819	54.1	55.1
Illinois	2,720	2,620	55.9	54.9
Indiana	2,158	2,200	52.7	50.0
Iowa	2,687	2,744	52.8	52.8
Kansas	3,955	3,848	41.9	41.7
Kentucky	1,551	1,619	57.6	57.3
Louisiana	1,027	1,018	74.1	74.6
Maine	416	405	57.2	57.0
Maryland	957	991	56.3	55.4
Massachusetts	333	310	52.3	58.4
Michigan	1,841	1,858	56.7	52.7
Minnesota	2,931	3,030	50.1	51.2
Mississippi	1,399	1,367	68.8	68.4
Missouri	3,071	3,161	48.3	49.7
Montana	2,347	2,330	49.4	53.6
Nebraska	3,552	3,599	44.7	47.4
Nevada	225	209	57.3	61.7
New Hampshire	237	230	54.4	53.9
New Jersey	389	412	59.4	55.6
New Mexico	575	577	61.7	61.5
New York	1,206	1,214	60.5	56.1
North Carolina	1,800	1,710	58.7	54.6
North Dakota	3,190	3,058	40.7	44.3
Ohio	1,749	1,770	54.8	49.9
Oklahoma	2,420	2,382	62.1	65.9
Oregon	1,235	1,131	55.1	56.3
Pennsylvania	1,502	1,488	56.6	55.3
Rhode Island	63	60	44.4	36.7
South Carolina	876	860	71.7	64.0
South Dakota	2,859	2,882	41.8	43.9
Tennessee	1,313	1,291	65.7	62.4
Texas	4,637	4,853	64.4	62.6
Utah	835	846	81.7	77.7
Vermont	498	497	57.0	57.9
Virginia	1,419	1,394	59.6	57.7
Washington	1,826	1,807	49.8	49.5
West Virginia	445	451	69.4	63.0
Wisconsin	2,010	2,025	59.0	56.7
Wyoming	928	897	59.1	63.2
United States	74,801	74,984	54.8	54.4

(NA) Not available.

June Agricultural Survey Sample Size and Response Rate - States and United States: 2019 and 2020

State	Sample Size		Response Rate	
	2019	2020	2019	2020
	(number)	(number)	(percent)	(percent)
Alabama	1,176	1,201	60.7	70.9
Alaska	77	77	55.8	64.9
Arizona	337	293	69.1	72.0
Arkansas	1,596	1,609	63.3	56.6
California	1,823	1,914	50.0	53.9
Colorado	1,741	1,803	41.8	45.3
Connecticut	92	97	47.8	38.1
Delaware	338	344	36.1	35.8
Florida	473	461	56.0	50.5
Georgia	1,489	1,511	52.5	54.6
Idaho	1,589	1,641	45.4	46.5
Illinois	2,123	2,262	48.2	51.4
Indiana	1,960	2,067	49.7	48.9
Iowa	2,604	2,295	47.7	48.6
Kansas	3,947	4,018	39.7	34.5
Kentucky	1,686	1,851	50.2	58.2
Louisiana	1,172	1,142	71.5	64.5
Maine	274	276	60.6	51.8
Maryland	891	934	57.8	48.8
Massachusetts	98	119	62.2	42.0
Michigan	1,785	1,873	58.8	54.8
Minnesota	2,336	2,498	46.2	51.1
Mississippi	1,280	1,297	63.8	63.2
Missouri	2,516	2,722	46.7	43.2
Montana	1,639	1,775	47.0	47.6
Nebraska	3,143	3,130	41.4	44.0
Nevada	218	219	58.3	54.3
New Hampshire	71	83	64.8	41.0
New Jersey	325	402	55.4	47.5
New Mexico	626	583	58.5	63.3
New York	1,114	1,152	58.3	47.7
North Carolina	1,509	1,523	55.8	67.0
North Dakota	2,467	2,729	36.8	37.1
Ohio	1,470	1,610	52.1	44.5
Oklahoma	2,168	2,337	60.7	57.3
Oregon	909	963	50.7	53.5
Pennsylvania	1,381	1,491	56.5	48.8
Rhode Island	18	30	44.4	30.0
South Carolina	965	971	59.5	55.9
South Dakota	2,578	2,733	40.3	40.7
Tennessee	1,305	1,425	56.6	64.4
Texas	4,107	4,059	58.8	58.5
Utah	634	702	71.5	77.9
Vermont	182	195	62.1	55.4
Virginia	1,220	1,242	53.1	63.0
Washington	1,543	1,418	44.1	44.4
West Virginia	402	402	62.9	76.9
Wisconsin	2,079	2,196	52.1	52.9
Wyoming	801	792	54.9	62.9
United States	66,277	68,467	51.1	51.3

September Agricultural Survey Sample Size and Response Rate - States and United States: 2019 and 2020

State	Sample Size		Response Rate	
	2019	2020	2019	2020
	(number)	(number)	(percent)	(percent)
Alabama	790	702	68.6	73.4
Alaska	142	143	55.6	64.3
Arizona	360	273	72.5	74.0
Arkansas	1,122	1,120	62.0	55.1
California	1,543	1,438	56.4	53.0
Colorado	994	1,101	40.7	47.4
Connecticut	(NA)	(NA)	(NA)	(NA)
Delaware	259	274	40.2	38.0
Florida	529	431	57.8	58.5
Georgia	1,083	1,090	55.7	59.4
Idaho	1,249	1,286	47.9	45.7
Illinois	2,243	2,169	53.3	61.3
Indiana	1,969	1,918	58.5	51.0
Iowa	2,567	2,488	59.3	53.3
Kansas	2,581	2,620	43.5	42.5
Kentucky	1,163	1,120	54.4	72.9
Louisiana	813	852	71.8	57.5
Maine	225	244	60.0	52.5
Maryland	689	739	48.2	54.1
Massachusetts	(NA)	(NA)	(NA)	(NA)
Michigan	1,433	1,421	61.5	61.2
Minnesota	2,128	2,148	57.2	46.5
Mississippi	1,172	1,151	66.5	66.6
Missouri	2,456	2,423	48.3	53.3
Montana	1,847	1,868	49.3	45.9
Nebraska	2,246	2,225	46.9	48.6
Nevada	(NA)	(NA)	(NA)	(NA)
New Hampshire	(NA)	(NA)	(NA)	(NA)
New Jersey	359	329	65.2	66.0
New Mexico	562	486	58.4	56.8
New York	945	1,028	61.6	59.3
North Carolina	1,108	1,081	52.3	76.5
North Dakota	2,271	2,371	43.6	43.9
Ohio	1,373	1,328	57.9	51.9
Oklahoma	2,055	2,196	65.8	58.1
Oregon	731	705	49.2	56.5
Pennsylvania	1,094	1,148	55.5	57.1
Rhode Island	(NA)	(NA)	(NA)	(NA)
South Carolina	898	920	64.6	65.0
South Dakota	2,303	2,291	45.2	40.1
Tennessee	980	943	65.6	70.2
Texas	3,169	3,168	66.7	61.1
Utah	624	620	78.5	76.9
Vermont	(NA)	(NA)	(NA)	(NA)
Virginia	902	866	58.0	68.0
Washington	1,365	1,290	47.2	40.1
West Virginia	387	312	72.9	85.6
Wisconsin	2,056	2,031	59.4	56.6
Wyoming	501	497	58.3	59.8
United States	55,286	54,854	55.8	55.0

(NA) Not available.

December Agricultural Survey Sample Size and Response Rate - States and United States: 2019 and 2020

State	Sample Size		Response Rate	
	2019	2020	2019	2020
	(number)	(number)	(percent)	(percent)
Alabama	1,043	989	65.5	73.9
Alaska	171	174	60.8	55.7
Arizona	493	348	72.4	74.7
Arkansas	1,758	1,780	63.3	59.1
California	2,331	2,187	50.5	50.3
Colorado	1,534	1,628	45.4	48.3
Connecticut	262	245	48.9	49.0
Delaware	387	392	36.2	38.5
Florida	889	855	56.7	56.6
Georgia	1,587	1,581	56.3	57.9
Idaho	1,650	1,618	48.8	53.6
Illinois	2,513	2,421	51.5	56.0
Indiana	2,503	2,440	54.3	51.5
Iowa	2,836	2,737	55.6	49.4
Kansas	3,001	3,031	40.7	47.0
Kentucky	1,651	1,597	49.3	65.8
Louisiana	1,436	1,473	71.0	72.9
Maine	370	367	51.6	55.3
Maryland	951	962	53.2	49.1
Massachusetts	283	286	57.2	64.0
Michigan	1,791	1,782	55.2	57.4
Minnesota	2,845	2,792	55.0	49.4
Mississippi	1,587	1,546	66.7	69.7
Missouri	3,240	3,185	45.5	50.4
Montana	2,213	2,222	51.6	53.3
Nebraska	3,159	3,158	40.5	47.5
Nevada	206	204	52.4	35.8
New Hampshire	212	207	43.9	53.6
New Jersey	496	479	52.8	59.5
New Mexico	708	638	59.2	63.6
New York	1,108	1,120	54.2	56.5
North Carolina	1,825	1,811	52.5	71.0
North Dakota	2,875	2,931	35.6	39.8
Ohio	1,692	1,672	58.0	51.2
Oklahoma	2,586	2,648	63.7	64.3
Oregon	906	841	54.3	57.9
Pennsylvania	1,375	1,383	55.9	49.9
Rhode Island	67	65	32.8	41.5
South Carolina	1,041	1,081	62.2	68.2
South Dakota	2,704	2,582	38.8	48.9
Tennessee	1,463	1,419	62.6	62.9
Texas	4,933	4,702	60.0	58.9
Utah	803	816	79.0	80.3
Vermont	509	499	57.4	57.9
Virginia	1,390	1,354	57.7	63.7
Washington	1,736	1,592	46.3	50.1
West Virginia	538	522	68.2	82.0
Wisconsin	2,193	2,144	58.4	55.2
Wyoming	658	629	59.0	63.4
United States	74,508	73,135	53.4	55.7

March Off Farm Grain Stocks Survey Sample Size and Response Rate - States and United States: 2019 and 2020

State	Sample Size		Response Rate	
	2019	2020	2019	2020
	(number)	(number)	(percent)	(percent)
Alabama	53	50	86.8	86.0
Alaska	(NA)	(NA)	(NA)	(NA)
Arizona	15	15	86.7	66.7
Arkansas	46	52	80.4	88.5
California	59	55	79.7	80.0
Colorado	44	47	79.5	78.7
Connecticut	(NA)	(NA)	(NA)	(NA)
Delaware	16	13	62.5	69.2
Florida	13	15	100.0	73.3
Georgia	94	92	93.6	88.0
Idaho	41	43	80.5	69.8
Illinois	302	294	77.8	76.9
Indiana	183	180	61.2	60.6
Iowa	309	305	87.4	89.2
Kansas	183	175	78.7	78.9
Kentucky	140	132	82.1	88.6
Louisiana	19	21	89.5	76.2
Maine	(NA)	(NA)	(NA)	(NA)
Maryland	35	32	51.4	81.3
Massachusetts	(NA)	(NA)	(NA)	(NA)
Michigan	111	107	98.2	97.2
Minnesota	304	304	67.4	64.1
Mississippi	30	33	86.7	84.8
Missouri	174	169	71.8	67.5
Montana	85	84	91.8	76.2
Nebraska	140	138	76.4	69.6
Nevada	(NA)	(NA)	(NA)	(NA)
New Hampshire [1]	13	14	38.5	21.4
New Jersey	9	4	100.0	25.0
New Mexico	4	4	100.0	75.0
New York	30	29	66.7	65.5
North Carolina	122	119	77.0	75.6
North Dakota	205	198	78.5	71.7
Ohio	160	158	65.6	72.8
Oklahoma	56	54	78.6	77.8
Oregon	29	29	79.3	65.5
Pennsylvania	121	117	78.5	65.8
Rhode Island	(NA)	(NA)	(NA)	(NA)
South Carolina	38	39	100.0	100.0
South Dakota	124	115	87.9	91.3
Tennessee	116	111	79.3	82.9
Texas	184	176	72.8	71.6
Utah	20	23	85.0	47.8
Vermont	(NA)	(NA)	(NA)	(NA)
Virginia	67	65	85.1	80.0
Washington	41	40	78.0	72.5
West Virginia	8	8	100.0	100.0
Wisconsin	167	168	69.5	64.3
Wyoming	14	13	71.4	61.5
United States	3,924	3,840	77.9	75.7

(NA) Not available.
[1] Includes data for Maine, Massachusetts, New Hampshire, and Vermont.

June Off Farm Grain Stocks Survey Sample Size and Response Rate - States and United States: 2019 and 2020

State	Sample Size		Response Rate	
	2019	2020	2019	2020
	(number)	(number)	(percent)	(percent)
Alabama	51	49	76.5	71.4
Alaska	(NA)	(NA)	(NA)	(NA)
Arizona	15	14	86.7	71.4
Arkansas	53	51	83.0	96.1
California	58	54	81.0	72.2
Colorado	45	44	82.2	86.4
Connecticut	(NA)	(NA)	(NA)	(NA)
Delaware	15	15	53.3	73.3
Florida	13	13	76.9	69.2
Georgia	94	90	93.6	91.1
Idaho	45	41	75.6	75.6
Illinois	300	285	75.3	75.1
Indiana	180	173	65.6	52.6
Iowa	305	293	88.5	91.5
Kansas	181	166	81.8	75.3
Kentucky	137	125	81.0	91.2
Louisiana	19	18	94.7	83.3
Maine	(NA)	(NA)	(NA)	(NA)
Maryland	35	32	65.7	78.1
Massachusetts	(NA)	(NA)	(NA)	(NA)
Michigan	111	108	98.2	90.7
Minnesota	302	295	67.5	67.8
Mississippi	30	33	86.7	90.9
Missouri	169	163	74.0	68.1
Montana	87	83	86.2	79.5
Nebraska	141	134	70.2	73.9
Nevada	(NA)	(NA)	(NA)	(NA)
New Hampshire [1]	11	14	27.3	50.0
New Jersey	9	4	77.8	100.0
New Mexico	5	3	100.0	100.0
New York	30	29	76.7	55.2
North Carolina	118	115	81.4	80.0
North Dakota	202	194	74.8	76.8
Ohio	159	147	72.3	61.2
Oklahoma	56	53	78.6	88.7
Oregon	28	28	78.6	67.9
Pennsylvania	119	110	74.8	66.4
Rhode Island	(NA)	(NA)	(NA)	(NA)
South Carolina	38	39	92.1	92.3
South Dakota	123	114	82.9	91.2
Tennessee	107	113	85.0	89.4
Texas	184	163	75.0	78.5
Utah	21	21	85.7	66.7
Vermont	(NA)	(NA)	(NA)	(NA)
Virginia	65	65	80.0	87.7
Washington	41	40	78.0	80.0
West Virginia	8	8	100.0	100.0
Wisconsin	166	165	68.7	63.6
Wyoming	14	12	71.4	66.7
United States	3,890	3,716	77.8	76.8

(NA) Not available.
[1] Includes data for Maine, Massachusetts, New Hampshire, and Vermont.

September Off Farm Grain Stocks Survey Sample Size and Response Rate - States and United States: 2019 and 2020

State	Sample Size		Response Rate	
	2019	2020	2019	2020
	(number)	(number)	(percent)	(percent)
Alabama	50	46	76.0	93.5
Alaska	(NA)	(NA)	(NA)	(NA)
Arizona	15	14	86.7	71.4
Arkansas	54	52	85.2	84.6
California	54	52	68.5	63.5
Colorado	44	42	79.5	76.2
Connecticut	(NA)	(NA)	(NA)	(NA)
Delaware	15	15	80.0	53.3
Florida	14	14	85.7	100.0
Georgia	92	91	90.2	92.3
Idaho	43	44	67.4	65.9
Illinois	301	287	73.4	67.9
Indiana	179	170	60.3	58.2
Iowa	303	295	89.1	86.8
Kansas	176	165	75.6	73.9
Kentucky	137	133	79.6	88.7
Louisiana	18	17	66.7	70.6
Maine	(NA)	(NA)	(NA)	(NA)
Maryland	34	32	79.4	62.5
Massachusetts	(NA)	(NA)	(NA)	(NA)
Michigan	110	107	99.1	95.3
Minnesota	303	296	75.6	68.6
Mississippi	32	33	71.9	90.9
Missouri	169	164	68.0	63.4
Montana	88	85	88.6	88.2
Nebraska	140	130	76.4	71.5
Nevada	(NA)	(NA)	(NA)	(NA)
New Hampshire [1]	13	14	30.8	28.6
New Jersey	5	4	40.0	25.0
New Mexico	4	4	100.0	100.0
New York	29	31	69.0	45.2
North Carolina	118	115	74.6	80.0
North Dakota	199	195	71.4	77.9
Ohio	159	147	71.7	61.9
Oklahoma	56	56	75.0	78.6
Oregon	29	30	75.9	70.0
Pennsylvania	116	113	63.8	61.9
Rhode Island	(NA)	(NA)	(NA)	(NA)
South Carolina	39	39	92.3	94.9
South Dakota	120	114	88.3	93.9
Tennessee	111	113	78.4	89.4
Texas	177	158	69.5	69.6
Utah	22	21	81.8	81.0
Vermont	(NA)	(NA)	(NA)	(NA)
Virginia	64	65	79.7	86.2
Washington	38	39	76.3	71.8
West Virginia	8	8	87.5	100.0
Wisconsin	166	164	69.9	64.6
Wyoming	15	13	66.7	76.9
United States	3,859	3,727	76.2	75.1

(NA) Not available.

[1] Includes data for Maine, Massachusetts, New Hampshire, and Vermont.

December Off Farm Grain Stocks Survey Sample Size and Response Rate - States and United States: 2019 and 2020

State	Sample Size		Response Rate	
	2019	2020	2019	2020
	(number)	(number)	(percent)	(percent)
Alabama	48	48	79.2	91.7
Alaska	(NA)	(NA)	(NA)	(NA)
Arizona	16	16	68.8	62.5
Arkansas	56	52	91.1	92.3
California	55	55	85.5	80.0
Colorado	45	46	73.3	71.7
Connecticut	(NA)	(NA)	(NA)	(NA)
Delaware	15	16	80.0	18.8
Florida	14	12	78.6	100.0
Georgia	91	90	93.4	94.4
Idaho	44	46	72.7	73.9
Illinois	294	285	78.6	71.6
Indiana	178	170	62.9	58.2
Iowa	298	287	90.9	92.3
Kansas	173	161	80.3	80.1
Kentucky	135	130	86.7	90.8
Louisiana	20	17	95.0	70.6
Maine	(NA)	(NA)	(NA)	(NA)
Maryland	33	32	75.8	53.1
Massachusetts	(NA)	(NA)	(NA)	(NA)
Michigan	107	107	100.0	86.9
Minnesota	298	291	66.8	65.6
Mississippi	32	33	84.4	72.7
Missouri	169	163	67.5	71.8
Montana	86	83	82.6	88.0
Nebraska	139	126	72.7	76.2
Nevada	(NA)	(NA)	(NA)	(NA)
New Hampshire [1]	13	14	61.5	64.3
New Jersey	5	4	40.0	100.0
New Mexico	5	4	100.0	100.0
New York	30	30	70.0	70.0
North Carolina	116	114	78.4	83.3
North Dakota	199	188	72.4	70.7
Ohio	159	150	67.9	67.3
Oklahoma	55	52	92.7	71.2
Oregon	28	29	85.7	75.9
Pennsylvania	120	109	66.7	66.1
Rhode Island	(NA)	(NA)	(NA)	(NA)
South Carolina	39	38	94.9	92.1
South Dakota	121	114	91.7	95.6
Tennessee	108	115	80.6	91.3
Texas	172	157	73.8	75.2
Utah	23	20	78.3	70.0
Vermont	(NA)	(NA)	(NA)	(NA)
Virginia	65	62	84.6	83.9
Washington	42	42	81.0	69.0
West Virginia	8	8	87.5	100.0
Wisconsin	163	163	64.4	63.2
Wyoming	15	12	73.3	58.3
United States	3,832	3,691	77.7	76.6

(NA) Not available.
[1] Includes data for Maine, Massachusetts, New Hampshire, and Vermont.

Quality Measures from the Agricultural Survey by Crop and Date - United States: 2019 and 2020

Date	Weighted Item Response Rate		Coefficient of Variation	
	2019	2020	2019	2020
	(percent)	(percent)	(percent)	(percent)
Corn Stocks				
March 1	47.2	46.7	1.9	1.8
June 1	39.3	44.6	2.4	2.5
September 1	46.3	41.1	3.0	3.1
December 1	48.3	48.0	1.5	1.6
Soybeans Stocks				
March 1	47.4	44.7	2.0	2.0
June 1	38.7	43.4	2.2	3.0
September 1	44.5	41.0	3.9	5.3
December 1	49.1	48.5	1.9	2.1
All Wheat Stocks				
March 1	39.6	39.9	2.8	2.9
June 1	32.9	34.2	3.3	3.5
September 1	40.5	36.7	3.0	2.5
December 1	38.9	38.8	2.7	2.7

Quality Measures from Off Farm Grain Stocks Survey by Crop and Date - United States: 2019 and 2020

Date	Weighted Item Response Rate		Coefficient of Variation	
	2019	2020	2019	2020
	(percent)	(percent)	(percent)	(percent)
Corn Stocks				
March 1	86.7	83.8	0.2	0.2
June 1	86.1	84.3	0.2	0.3
September 1	84.4	80.6	0.3	0.3
December 1	84.8	84.3	0.2	0.2
Soybeans Stocks				
March 1	86.7	84.6	0.3	0.2
June 1	86.4	84.4	0.3	0.2
September 1	82.2	86.0	0.6	0.2
December 1	85.6	86.0	0.3	0.2
All Wheat Stocks				
March 1	91.1	84.8	0.3	0.4
June 1	93.2	82.9	0.3	0.5
September 1	82.7	80.2	0.3	0.3
December 1	85.7	84.0	0.3	0.4

Information Contacts

Process	Unit	Telephone	Email
Estimation	Crops Branch	(202) 720-2127	HQ_SD_CB@usda.gov
Data Collection	Survey Administration Branch	(202) 690-4847	HQ_CSD_SAB@usda.gov
Questionnaires	Data Collection Branch	(202) 720-6201	HQ_CSD_DCB@usda.gov
Sampling and Editing	Sampling, Editing, and Imputation Methodology Branch	(202) 690-8141	HQ_CSD_SB@usda.gov
Analysis and Estimators	Summary, Estimation, and Disclosure Methodology Branch	(202) 690-8141	HQ_SD_SMB@usda.gov
Dissemination	Data Dissemination Office	(202) 720-3869	HQSDOD@usda.gov
Media Contact and Webmaster	Public Affairs Office	(202) 720-2639	HQOAPAO@usda.gov

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