



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 list frame 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 1.7% to 11.0% for soybean stocks, and from 2.2% to 5.0% for all wheat stocks.

The OFGS target population is all entities in the United States that can store at least 1,000 bushels of grain (e.g. elevators, grain and oilseed processing plants, terminals, and any other facilities that store grain or oilseeds excluding peanuts and rice) off the farm. 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. 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.

For the Agricultural Survey, 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” for list frame records 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. The algorithm defines “imputation groups” for NOL records as ASD and within the same strata type at the time of sampling.

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. When appropriate, if a stocks value is available for the previous quarter, the ratio of the current stocks value to the previous stocks value is calculated from the respondents in an imputation group. This ratio is applied to the nonrespondent's previous quarter stocks value. When a previous quarter stocks value is not available, missing stocks are imputed similarly to capacity using the respondents' ratio of stocks to list frame capacity within each imputation group. If list frame capacity is not available for the nonrespondent, the weighted mean stocks for the imputation group are imputed for the nonrespondent. An imputation group must have five or more respondents before it is used. List frame records with insufficient response are collapsed across ASD and, if there is still insufficient response, collapsed with adjacent strata. NOL records with insufficient response are collapsed across strata types and, if there is still insufficient response, collapsed across ASD.

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: 2020 and 2021

State	Sample Size		Response Rate	
	2020 (number)	2021 (number)	2020 (percent)	2021 (percent)
Alabama	815	771	56.0	62.4
Alaska	114	115	55.3	52.2
Arizona	422	310	63.5	69.4
Arkansas	1,702	1,695	66.0	56.6
California	2,278	2,151	51.4	52.2
Colorado	1,955	1,923	50.0	46.2
Connecticut	281	297	50.5	47.8
Delaware	402	391	41.0	53.5
Florida	658	650	55.9	47.5
Georgia	1,394	1,405	54.6	52.7
Idaho	1,819	1,797	55.1	48.2
Illinois	2,620	2,539	54.9	53.5
Indiana	2,200	2,292	50.0	50.8
Iowa	2,744	2,609	52.8	49.2
Kansas	3,848	3,781	41.7	43.9
Kentucky	1,619	1,525	57.3	65.4
Louisiana	1,018	1,046	74.6	66.2
Maine	405	411	57.0	56.0
Maryland	991	974	55.4	52.9
Massachusetts	310	310	58.4	58.4
Michigan	1,858	1,836	52.7	57.7
Minnesota	3,030	2,958	51.2	47.6
Mississippi	1,367	1,347	68.4	65.6
Missouri	3,161	3,077	49.7	47.8
Montana	2,330	2,313	53.6	49.6
Nebraska	3,599	3,523	47.4	48.7
Nevada	209	202	61.7	63.9
New Hampshire	230	221	53.9	55.7
New Jersey	412	402	55.6	54.7
New Mexico	577	557	61.5	54.9
New York	1,214	1,192	56.1	60.8
North Carolina	1,710	1,642	54.6	62.1
North Dakota	3,058	3,105	44.3	49.6
Ohio	1,770	1,774	49.9	48.5
Oklahoma	2,382	2,382	65.9	62.8
Oregon	1,131	1,167	56.3	51.1
Pennsylvania	1,488	1,485	55.3	50.6
Rhode Island	60	58	36.7	37.9
South Carolina	860	887	64.0	58.9
South Dakota	2,882	2,804	43.9	48.3
Tennessee	1,291	1,281	62.4	64.5
Texas	4,853	4,542	62.6	58.9
Utah	846	841	77.7	77.6
Vermont	497	476	57.9	61.8
Virginia	1,394	1,371	57.7	65.4
Washington	1,807	1,763	49.5	41.1
West Virginia	451	446	63.0	73.1
Wisconsin	2,025	2,009	56.7	55.5
Wyoming	897	910	63.2	60.0
United States	74,984	73,563	54.4	53.7

June Agricultural Survey Sample Size and Response Rate - States and United States: 2020 and 2021

State	Sample Size		Response Rate	
	2020 (number)	2021 (number)	2020 (percent)	2021 (percent)
Alabama	1,201	1,080	70.9	50.4
Alaska	77	77	64.9	53.2
Arizona	293	271	72.0	65.7
Arkansas	1,609	1,552	56.6	47.5
California	1,914	1,799	53.9	48.7
Colorado	1,803	1,715	45.3	34.8
Connecticut	97	88	38.1	48.9
Delaware	344	312	35.8	39.7
Florida	461	417	50.5	40.5
Georgia	1,511	1,480	54.6	40.5
Idaho	1,641	1,593	46.5	39.9
Illinois	2,262	2,122	51.4	42.4
Indiana	2,067	1,946	48.9	42.7
Iowa	2,295	2,116	48.6	42.8
Kansas	4,018	3,851	34.5	33.9
Kentucky	1,851	1,702	58.2	56.6
Louisiana	1,142	1,100	64.5	60.9
Maine	276	262	51.8	43.9
Maryland	934	892	48.8	43.0
Massachusetts	119	101	42.0	70.3
Michigan	1,873	1,705	54.8	48.9
Minnesota	2,498	2,361	51.1	37.9
Mississippi	1,297	1,218	63.2	53.2
Missouri	2,722	2,519	43.2	37.0
Montana	1,775	1,780	47.6	42.7
Nebraska	3,130	2,993	44.0	32.8
Nevada	219	189	54.3	31.7
New Hampshire	83	67	41.0	55.2
New Jersey	402	366	47.5	37.4
New Mexico	583	551	63.3	53.5
New York	1,152	1,114	47.7	43.3
North Carolina	1,523	1,452	67.0	59.7
North Dakota	2,729	2,599	37.1	31.7
Ohio	1,610	1,440	44.5	40.7
Oklahoma	2,337	2,194	57.3	56.1
Oregon	963	882	53.5	46.9
Pennsylvania	1,491	1,372	48.8	35.4
Rhode Island	30	19	30.0	31.6
South Carolina	971	874	55.9	46.3
South Dakota	2,733	2,590	40.7	35.6
Tennessee	1,425	1,274	64.4	58.0
Texas	4,059	3,471	58.5	46.4
Utah	702	592	77.9	69.9
Vermont	195	183	55.4	42.6
Virginia	1,242	1,175	63.0	57.7
Washington	1,418	1,380	44.4	40.5
West Virginia	402	388	76.9	54.6
Wisconsin	2,196	2,060	52.9	48.0
Wyoming	792	762	62.9	55.9
United States	68,467	64,046	51.3	44.0

**September Agricultural Survey Sample Size and Response Rate - States and United States:
2020 and 2021**

State	Sample Size		Response Rate	
	2020 (number)	2021 (number)	2020 (percent)	2021 (percent)
Alabama	702	752	73.4	57.3
Alaska	143	149	64.3	65.1
Arizona	273	304	74.0	66.8
Arkansas	1,120	1,216	55.1	53.3
California	1,438	1,489	53.0	52.0
Colorado	1,101	1,152	47.4	42.2
Connecticut	(NA)	(NA)	(NA)	(NA)
Delaware	274	231	38.0	43.3
Florida	431	439	58.5	48.5
Georgia	1,090	1,134	59.4	50.4
Idaho	1,286	1,326	45.7	47.1
Illinois	2,169	2,184	61.3	54.7
Indiana	1,918	1,977	51.0	47.2
Iowa	2,488	2,552	53.3	48.0
Kansas	2,620	2,552	42.5	41.5
Kentucky	1,120	1,158	72.9	69.2
Louisiana	852	878	57.5	71.1
Maine	244	218	52.5	58.7
Maryland	739	693	54.1	50.4
Massachusetts	(NA)	(NA)	(NA)	(NA)
Michigan	1,421	1,397	61.2	58.4
Minnesota	2,148	2,178	46.5	48.6
Mississippi	1,151	1,197	66.6	67.1
Missouri	2,423	2,470	53.3	50.4
Montana	1,868	1,838	45.9	48.6
Nebraska	2,225	2,268	48.6	44.6
Nevada	(NA)	(NA)	(NA)	(NA)
New Hampshire	(NA)	(NA)	(NA)	(NA)
New Jersey	329	342	66.0	47.7
New Mexico	486	494	56.8	59.9
New York	1,028	1,002	59.3	60.2
North Carolina	1,081	1,114	76.5	72.7
North Dakota	2,371	2,370	43.9	43.7
Ohio	1,328	1,381	51.9	47.8
Oklahoma	2,196	2,091	58.1	66.0
Oregon	705	739	56.5	49.4
Pennsylvania	1,148	1,129	57.1	52.2
Rhode Island	(NA)	(NA)	(NA)	(NA)
South Carolina	920	898	65.0	57.3
South Dakota	2,291	2,324	40.1	45.8
Tennessee	943	929	70.2	67.5
Texas	3,168	3,218	61.1	55.7
Utah	620	609	76.9	77.7
Vermont	(NA)	(NA)	(NA)	(NA)
Virginia	866	895	68.0	62.8
Washington	1,290	1,307	40.1	47.7
West Virginia	312	381	85.6	76.9
Wisconsin	2,031	2,047	56.6	57.4
Wyoming	497	504	59.8	54.8
United States	54,854	55,526	55.0	53.3

(NA) Not available.

**December Agricultural Survey Sample Size and Response Rate - States and United States:
2020 and 2021**

State	Sample Size		Response Rate	
	2020 (number)	2021 (number)	2020 (percent)	2021 (percent)
Alabama	989	1,008	73.9	49.2
Alaska	174	173	55.7	58.4
Arizona	348	397	74.7	67.8
Arkansas	1,780	1,819	59.1	49.5
California	2,187	2,197	50.3	50.5
Colorado	1,628	1,666	48.3	41.9
Connecticut	245	249	49.0	51.0
Delaware	392	359	38.5	39.3
Florida	855	797	56.6	44.5
Georgia	1,581	1,604	57.9	46.0
Idaho	1,618	1,654	53.6	49.3
Illinois	2,421	2,461	56.0	49.8
Indiana	2,440	2,387	51.5	49.1
Iowa	2,737	2,823	49.4	43.7
Kansas	3,031	2,912	47.0	40.1
Kentucky	1,597	1,603	65.8	54.7
Louisiana	1,473	1,451	72.9	67.8
Maine	367	357	55.3	48.7
Maryland	962	956	49.1	43.3
Massachusetts	286	288	64.0	63.2
Michigan	1,782	1,671	57.4	58.5
Minnesota	2,792	2,780	49.4	45.3
Mississippi	1,546	1,560	69.7	63.5
Missouri	3,185	3,247	50.4	43.9
Montana	2,222	2,140	53.3	49.4
Nebraska	3,158	3,118	47.5	37.1
Nevada	204	202	35.8	37.6
New Hampshire	207	207	53.6	57.5
New Jersey	479	515	59.5	44.7
New Mexico	638	606	63.6	53.5
New York	1,120	1,120	56.5	53.1
North Carolina	1,811	1,765	71.0	65.2
North Dakota	2,931	2,930	39.8	42.1
Ohio	1,672	1,657	51.2	48.9
Oklahoma	2,648	2,468	64.3	58.6
Oregon	841	873	57.9	48.1
Pennsylvania	1,383	1,406	49.9	42.5
Rhode Island	65	63	41.5	28.6
South Carolina	1,081	1,075	68.2	53.7
South Dakota	2,582	2,558	48.9	44.7
Tennessee	1,419	1,401	62.9	61.4
Texas	4,702	4,529	58.9	53.4
Utah	816	793	80.3	79.6
Vermont	499	506	57.9	52.6
Virginia	1,354	1,367	63.7	60.4
Washington	1,592	1,578	50.1	44.1
West Virginia	522	551	82.0	70.6
Wisconsin	2,144	2,142	55.2	53.0
Wyoming	629	614	63.4	59.3
United States	73,135	72,603	55.7	50.1

March Off Farm Grain Stocks Survey Sample Size and Response Rate - States and United States: 2020 and 2021

State	Sample Size		Response Rate	
	2020 (number)	2021 (number)	2020 (percent)	2021 (percent)
Alabama	50	48	86.0	93.8
Alaska	(NA)	(NA)	(NA)	(NA)
Arizona	15	15	66.7	73.3
Arkansas	52	52	88.5	78.8
California	55	54	80.0	75.9
Colorado	47	43	78.7	76.7
Connecticut	(NA)	(NA)	(NA)	(NA)
Delaware	13	17	69.2	5.9
Florida	15	12	73.3	83.3
Georgia	92	88	88.0	92.0
Idaho	43	42	69.8	83.3
Illinois	294	284	76.9	72.5
Indiana	180	169	60.6	56.8
Iowa	305	293	89.2	90.4
Kansas	175	160	78.9	78.1
Kentucky	132	133	88.6	88.7
Louisiana	21	18	76.2	66.7
Maine	(NA)	(NA)	(NA)	(NA)
Maryland	32	33	81.3	51.5
Massachusetts	(NA)	(NA)	(NA)	(NA)
Michigan	107	107	97.2	79.4
Minnesota	304	288	64.1	66.3
Mississippi	33	33	84.8	78.8
Missouri	169	163	67.5	68.7
Montana	84	82	76.2	81.7
Nebraska	138	128	69.6	75.0
Nevada	(NA)	(NA)	(NA)	(NA)
New Hampshire ¹	14	14	21.4	57.1
New Jersey	4	4	25.0	75.0
New Mexico	4	4	75.0	75.0
New York	29	32	65.5	37.5
North Carolina	119	113	75.6	79.6
North Dakota	198	192	71.7	74.0
Ohio	158	150	72.8	58.7
Oklahoma	54	55	77.8	78.2
Oregon	29	27	65.5	70.4
Pennsylvania	117	110	65.8	54.5
Rhode Island	(NA)	(NA)	(NA)	(NA)
South Carolina	39	38	100.0	84.2
South Dakota	115	112	91.3	92.9
Tennessee	111	113	82.9	91.2
Texas	176	168	71.6	69.0
Utah	23	21	47.8	71.4
Vermont	(NA)	(NA)	(NA)	(NA)
Virginia	65	64	80.0	79.7
Washington	40	38	72.5	86.8
West Virginia	8	8	100.0	100.0
Wisconsin	168	163	64.3	65.0
Wyoming	13	12	61.5	83.3
United States	3,840	3,700	75.7	74.6

(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: 2020 and 2021

State	Sample Size		Response Rate	
	2020 (number)	2021 (number)	2020 (percent)	2021 (percent)
Alabama	49	48	71.4	91.7
Alaska	(NA)	(NA)	(NA)	(NA)
Arizona	14	16	71.4	68.8
Arkansas	51	50	96.1	82.0
California	54	54	72.2	85.2
Colorado	44	46	86.4	87.0
Connecticut	(NA)	(NA)	(NA)	(NA)
Delaware	15	17	73.3	11.8
Florida	13	12	69.2	83.3
Georgia	90	87	91.1	94.3
Idaho	41	45	75.6	75.6
Illinois	285	284	75.1	72.9
Indiana	173	170	52.6	53.5
Iowa	293	292	91.5	90.1
Kansas	166	162	75.3	67.9
Kentucky	125	132	91.2	87.1
Louisiana	18	18	83.3	100.0
Maine	(NA)	(NA)	(NA)	(NA)
Maryland	32	33	78.1	33.3
Massachusetts	(NA)	(NA)	(NA)	(NA)
Michigan	108	106	90.7	80.2
Minnesota	295	289	67.8	62.6
Mississippi	33	33	90.9	90.9
Missouri	163	162	68.1	65.4
Montana	83	85	79.5	80.0
Nebraska	134	130	73.9	73.1
Nevada	(NA)	(NA)	(NA)	(NA)
New Hampshire ¹	14	14	50.0	42.9
New Jersey	4	4	100.0	75.0
New Mexico	3	4	100.0	100.0
New York	29	30	55.2	53.3
North Carolina	115	112	80.0	75.9
North Dakota	194	190	76.8	71.6
Ohio	147	150	61.2	68.0
Oklahoma	53	51	88.7	70.6
Oregon	28	28	67.9	67.9
Pennsylvania	110	109	66.4	51.4
Rhode Island	(NA)	(NA)	(NA)	(NA)
South Carolina	39	38	92.3	81.6
South Dakota	114	112	91.2	94.6
Tennessee	113	112	89.4	88.4
Texas	163	170	78.5	65.3
Utah	21	22	66.7	77.3
Vermont	(NA)	(NA)	(NA)	(NA)
Virginia	65	64	87.7	65.6
Washington	40	42	80.0	78.6
West Virginia	8	8	100.0	87.5
Wisconsin	165	162	63.6	63.0
Wyoming	12	13	66.7	92.3
United States	3,716	3,706	76.8	73.2

(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: 2020 and 2021

State	Sample Size		Response Rate	
	2020 (number)	2021 (number)	2020 (percent)	2021 (percent)
Alabama	46	48	93.5	91.7
Alaska	(NA)	(NA)	(NA)	(NA)
Arizona	14	16	71.4	68.8
Arkansas	52	51	84.6	82.4
California	52	55	63.5	60.0
Colorado	42	47	76.2	68.1
Connecticut	(NA)	(NA)	(NA)	(NA)
Delaware	15	17	53.3	29.4
Florida	14	12	100.0	100.0
Georgia	91	87	92.3	94.3
Idaho	44	41	65.9	70.7
Illinois	287	275	67.9	71.6
Indiana	170	169	58.2	55.0
Iowa	295	290	86.8	83.1
Kansas	165	158	73.9	73.4
Kentucky	133	137	88.7	92.0
Louisiana	17	16	70.6	56.3
Maine	(NA)	(NA)	(NA)	(NA)
Maryland	32	33	62.5	42.4
Massachusetts	(NA)	(NA)	(NA)	(NA)
Michigan	107	106	95.3	90.6
Minnesota	296	289	68.6	65.7
Mississippi	33	31	90.9	67.7
Missouri	164	162	63.4	60.5
Montana	85	86	88.2	75.6
Nebraska	130	129	71.5	57.4
Nevada	(NA)	(NA)	(NA)	(NA)
New Hampshire ¹	14	14	28.6	21.4
New Jersey	4	4	25.0	75.0
New Mexico	4	4	100.0	75.0
New York	31	30	45.2	66.7
North Carolina	115	109	80.0	76.1
North Dakota	195	192	77.9	76.0
Ohio	147	149	61.9	63.1
Oklahoma	56	53	78.6	86.8
Oregon	30	28	70.0	60.7
Pennsylvania	113	109	61.9	64.2
Rhode Island	(NA)	(NA)	(NA)	(NA)
South Carolina	39	38	94.9	89.5
South Dakota	114	110	93.9	89.1
Tennessee	113	112	89.4	91.1
Texas	158	173	69.6	61.8
Utah	21	23	81.0	73.9
Vermont	(NA)	(NA)	(NA)	(NA)
Virginia	65	67	86.2	91.0
Washington	39	38	71.8	60.5
West Virginia	8	8	100.0	100.0
Wisconsin	164	160	64.6	62.5
Wyoming	13	11	76.9	72.7
United States	3,727	3,687	75.1	72.5

(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: 2020 and 2021

State	Sample Size		Response Rate	
	2020 (number)	2021 (number)	2020 (percent)	2021 (percent)
Alabama	48	47	91.7	83.0
Alaska	(NA)	(NA)	(NA)	(NA)
Arizona	16	15	62.5	60.0
Arkansas	52	50	92.3	82.0
California	55	55	80.0	54.5
Colorado	46	46	71.7	63.0
Connecticut	(NA)	(NA)	(NA)	(NA)
Delaware	16	17	18.8	29.4
Florida	12	10	100.0	70.0
Georgia	90	82	94.4	87.8
Idaho	46	42	73.9	73.8
Illinois	285	285	71.6	72.3
Indiana	170	166	58.2	51.8
Iowa	287	289	92.3	89.3
Kansas	161	160	80.1	64.4
Kentucky	130	137	90.8	89.1
Louisiana	17	17	70.6	82.4
Maine	(NA)	(NA)	(NA)	(NA)
Maryland	32	31	53.1	41.9
Massachusetts	(NA)	(NA)	(NA)	(NA)
Michigan	107	106	86.9	91.5
Minnesota	291	282	65.6	63.1
Mississippi	33	31	72.7	90.3
Missouri	163	164	71.8	62.8
Montana	83	79	88.0	79.7
Nebraska	126	129	76.2	72.1
Nevada	(NA)	(NA)	(NA)	(NA)
New Hampshire ¹	14	14	64.3	21.4
New Jersey	4	4	100.0	50.0
New Mexico	4	5	100.0	80.0
New York	30	33	70.0	45.5
North Carolina	114	107	83.3	81.3
North Dakota	188	188	70.7	70.7
Ohio	150	147	67.3	56.5
Oklahoma	52	52	71.2	67.3
Oregon	29	27	75.9	74.1
Pennsylvania	109	106	66.1	63.2
Rhode Island	(NA)	(NA)	(NA)	(NA)
South Carolina	38	36	92.1	86.1
South Dakota	114	111	95.6	95.5
Tennessee	115	105	91.3	93.3
Texas	157	172	75.2	61.0
Utah	20	21	70.0	85.7
Vermont	(NA)	(NA)	(NA)	(NA)
Virginia	62	63	83.9	92.1
Washington	42	44	69.0	77.3
West Virginia	8	8	100.0	100.0
Wisconsin	163	157	63.2	60.5
Wyoming	12	11	58.3	72.7
United States	3,691	3,651	76.6	72.2

(NA) Not available.

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

Quality Metrics from the Agricultural Survey by Crop and Date - United States: 2020 and 2021

Date	Weighted Item Response Rate		Coefficient of Variation	
	2020	2021	2020	2021
	(percent)	(percent)	(percent)	(percent)
Corn Stocks				
March 1	46.7	46.1	1.8	1.8
June 1	44.6	30.2	2.5	3.1
September 1	41.1	32.6	3.1	3.6
December 1	48.0	42.5	1.6	1.6
Soybeans Stocks				
March 1	44.7	45.0	2.0	2.7
June 1	43.4	31.6	3.0	4.2
September 1	41.0	31.2	5.3	5.9
December 1	48.5	43.1	2.1	2.1
All Wheat Stocks				
March 1	39.9	37.8	2.9	3.0
June 1	34.2	25.2	3.5	4.5
September 1	36.7	36.1	2.5	2.9
December 1	38.8	35.7	2.7	2.6

Quality Metrics from Off Farm Grain Stocks Survey by Crop and Date - United States: 2020 and 2021

Date	Weighted Item Response Rate		Coefficient of Variation	
	2020	2021	2020	2021
	(percent)	(percent)	(percent)	(percent)
Corn Stocks				
March 1	83.8	83.6	0.2	0.3
June 1	84.3	81.2	0.3	0.2
September 1	80.6	78.5	0.3	0.4
December 1	84.3	80.1	0.2	0.2
Soybeans Stocks				
March 1	84.6	86.3	0.2	0.2
June 1	84.4	83.4	0.2	0.3
September 1	86.0	83.1	0.2	0.4
December 1	86.0	84.2	0.2	0.2
All Wheat Stocks				
March 1	84.8	80.7	0.4	0.4
June 1	82.9	77.6	0.5	0.7
September 1	80.2	80.3	0.3	0.4
December 1	84.0	81.5	0.4	0.5

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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