



# Grain Stocks Methodology and Quality Measures

ISSN: 2167-3225

Released February 3, 2023, by the National Agricultural Statistics Service (NASS), Agricultural Statistics Board, United States Department of Agriculture (USDA).

## Special Note

Weighted item response rates for June 2021 have been updated from what was published in last year's report due to an error found in the calculation. The updated weighted item response rates are found on page 15.

**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:** All Regional Field Offices (RFO) use the same standardized questionnaire for data collection. For consistency across modes, the paper version is considered the master questionnaire and the Computer Assisted Self Interview (CASI), mobile Computer Assisted Telephone Interview (mCATI), 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 CASI, mCATI, 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.

For the Agricultural Survey, the imputation program imputes for missing survey data using previously reported survey 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. Area frame records are grouped for imputation using ASD and similar strata.

Capacity is imputed first 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 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: 2021 and 2022

State	Sample Size		Response Rate	
	2021 (number)	2022 (number)	2021 (percent)	2022 (percent)
Alabama	771	781	62.4	58.8
Alaska	115	116	52.2	53.4
Arizona	310	342	69.4	64.3
Arkansas	1,695	1,716	56.6	57.1
California	2,151	2,150	52.2	43.2
Colorado	1,923	1,965	46.2	41.1
Connecticut	297	297	47.8	43.1
Delaware	391	366	53.5	44.5
Florida	650	628	47.5	45.9
Georgia	1,405	1,361	52.7	45.4
Idaho	1,797	1,791	48.2	51.2
Illinois	2,539	2,526	53.5	50.1
Indiana	2,292	2,254	50.8	47.4
Iowa	2,609	2,632	49.2	42.5
Kansas	3,781	3,698	43.9	39.3
Kentucky	1,525	1,515	65.4	58.5
Louisiana	1,046	1,052	66.2	64.2
Maine	411	393	56.0	51.9
Maryland	974	1,008	52.9	46.3
Massachusetts	310	292	58.4	56.5
Michigan	1,836	1,744	57.7	56.8
Minnesota	2,958	2,931	47.6	43.2
Mississippi	1,347	1,344	65.6	60.5
Missouri	3,077	3,156	47.8	44.0
Montana	2,313	2,279	49.6	46.2
Nebraska	3,523	3,486	48.7	38.6
Nevada	202	207	63.9	47.3
New Hampshire	221	213	55.7	49.8
New Jersey	402	413	54.7	54.2
New Mexico	557	508	54.9	53.0
New York	1,192	1,216	60.8	51.3
North Carolina	1,642	1,623	62.1	64.7
North Dakota	3,105	3,091	49.6	42.4
Ohio	1,774	1,689	48.5	47.5
Oklahoma	2,382	2,271	62.8	59.0
Oregon	1,167	1,153	51.1	52.0
Pennsylvania	1,485	1,541	50.6	48.7
Rhode Island	58	59	37.9	28.8
South Carolina	887	929	58.9	55.1
South Dakota	2,804	2,764	48.3	42.3
Tennessee	1,281	1,255	64.5	60.2
Texas	4,542	4,413	58.9	53.2
Utah	841	830	77.6	72.7
Vermont	476	493	61.8	55.0
Virginia	1,371	1,385	65.4	61.4
Washington	1,763	1,706	41.1	42.8
West Virginia	446	468	73.1	72.2
Wisconsin	2,009	2,000	55.5	51.6
Wyoming	910	904	60.0	55.4
United States	73,563	72,954	53.7	49.4

## June Agricultural Survey Sample Size and Response Rate - States and United States: 2021 and 2022

State	Sample Size		Response Rate	
	2021 (number)	2022 (number)	2021 (percent)	2022 (percent)
Alabama	1,080	1,056	50.4	44.6
Alaska	77	76	53.2	50.0
Arizona	271	284	65.7	58.8
Arkansas	1,552	1,551	47.5	49.8
California	1,799	1,701	48.7	41.6
Colorado	1,715	1,643	34.8	35.4
Connecticut	88	82	48.9	48.8
Delaware	312	298	39.7	33.2
Florida	417	405	40.5	37.8
Georgia	1,480	1,481	40.5	36.2
Idaho	1,593	1,612	39.9	42.2
Illinois	2,122	2,194	42.4	41.9
Indiana	1,946	2,011	42.7	38.1
Iowa	2,116	2,141	42.8	39.6
Kansas	3,851	3,913	33.9	31.1
Kentucky	1,702	1,676	56.6	59.6
Louisiana	1,100	1,052	60.9	57.7
Maine	262	253	43.9	45.5
Maryland	892	841	43.0	36.7
Massachusetts	101	96	70.3	49.0
Michigan	1,705	1,721	48.9	44.7
Minnesota	2,361	2,344	37.9	32.0
Mississippi	1,218	1,178	53.2	56.6
Missouri	2,519	2,512	37.0	39.1
Montana	1,780	1,788	42.7	45.0
Nebraska	2,993	3,042	32.8	33.1
Nevada	189	186	31.7	34.4
New Hampshire	67	64	55.2	51.6
New Jersey	366	372	37.4	41.9
New Mexico	551	543	53.5	40.5
New York	1,114	1,109	43.3	43.0
North Carolina	1,452	1,467	59.7	61.6
North Dakota	2,599	2,635	31.7	26.5
Ohio	1,440	1,515	40.7	37.5
Oklahoma	2,194	2,224	56.1	54.6
Oregon	882	891	46.9	46.6
Pennsylvania	1,372	1,413	35.4	44.0
Rhode Island	19	19	31.6	47.4
South Carolina	874	880	46.3	42.2
South Dakota	2,590	2,660	35.6	32.9
Tennessee	1,274	1,305	58.0	55.6
Texas	3,471	3,459	46.4	51.7
Utah	592	627	69.9	57.9
Vermont	183	176	42.6	43.8
Virginia	1,175	1,169	57.7	42.6
Washington	1,380	1,373	40.5	39.3
West Virginia	388	386	54.6	53.4
Wisconsin	2,060	2,053	48.0	45.9
Wyoming	762	771	55.9	40.1
United States	64,046	64,248	44.0	42.2

**September Agricultural Survey Sample Size and Response Rate - States and United States:  
2021 and 2022**

State	Sample Size		Response Rate	
	2021 (number)	2022 (number)	2021 (percent)	2022 (percent)
Alabama	752	782	57.3	61.3
Alaska	149	147	65.1	43.5
Arizona	304	317	66.8	63.1
Arkansas	1,216	1,206	53.3	53.8
California	1,489	1,440	52.0	41.0
Colorado	1,152	1,142	42.2	43.8
Connecticut	(NA)	(NA)	(NA)	(NA)
Delaware	231	239	43.3	33.1
Florida	439	409	48.5	48.2
Georgia	1,134	1,130	50.4	50.4
Idaho	1,326	1,325	47.1	40.2
Illinois	2,184	2,330	54.7	51.4
Indiana	1,977	2,028	47.2	47.9
Iowa	2,552	2,631	48.0	45.3
Kansas	2,552	2,612	41.5	37.9
Kentucky	1,158	1,142	69.2	61.7
Louisiana	878	867	71.1	67.1
Maine	218	230	58.7	59.1
Maryland	693	699	50.4	42.6
Massachusetts	(NA)	(NA)	(NA)	(NA)
Michigan	1,397	1,395	58.4	53.2
Minnesota	2,178	2,138	48.6	40.5
Mississippi	1,197	1,181	67.1	63.7
Missouri	2,470	2,470	50.4	44.0
Montana	1,838	1,873	48.6	47.9
Nebraska	2,268	2,246	44.6	45.5
Nevada	(NA)	(NA)	(NA)	(NA)
New Hampshire	(NA)	(NA)	(NA)	(NA)
New Jersey	342	332	47.7	52.4
New Mexico	494	517	59.9	46.2
New York	1,002	927	60.2	53.8
North Carolina	1,114	1,110	72.7	64.8
North Dakota	2,370	2,457	43.7	42.3
Ohio	1,381	1,420	47.8	50.2
Oklahoma	2,091	2,167	66.0	59.1
Oregon	739	741	49.4	41.2
Pennsylvania	1,129	1,189	52.2	52.1
Rhode Island	(NA)	(NA)	(NA)	(NA)
South Carolina	898	870	57.3	61.5
South Dakota	2,324	2,348	45.8	44.8
Tennessee	929	994	67.5	60.7
Texas	3,218	3,192	55.7	52.8
Utah	609	632	77.7	72.2
Vermont	(NA)	(NA)	(NA)	(NA)
Virginia	895	900	62.8	59.6
Washington	1,307	1,307	47.7	31.3
West Virginia	381	361	76.9	75.9
Wisconsin	2,047	2,076	57.4	50.1
Wyoming	504	483	54.8	52.6
United States	55,526	56,002	53.3	49.5

(NA) Not available.

**December Agricultural Survey Sample Size and Response Rate - States and United States:  
2021 and 2022**

State	Sample Size		Response Rate	
	2021 (number)	2022 (number)	2021 (percent)	2022 (percent)
Alabama	1,008	982	49.2	63.2
Alaska	173	179	58.4	45.8
Arizona	397	387	67.8	64.9
Arkansas	1,819	1,815	49.5	57.4
California	2,197	2,054	50.5	41.2
Colorado	1,666	1,560	41.9	42.4
Connecticut	249	229	51.0	57.6
Delaware	359	370	39.3	35.1
Florida	797	751	44.5	47.3
Georgia	1,604	1,606	46.0	49.8
Idaho	1,654	1,702	49.3	49.7
Illinois	2,461	2,584	49.8	49.7
Indiana	2,387	2,489	49.1	45.3
Iowa	2,823	2,862	43.7	45.8
Kansas	2,912	2,988	40.1	36.0
Kentucky	1,603	1,572	54.7	56.3
Louisiana	1,451	1,332	67.8	61.6
Maine	357	340	48.7	56.2
Maryland	956	971	43.3	42.8
Massachusetts	288	280	63.2	62.1
Michigan	1,671	1,720	58.5	54.3
Minnesota	2,780	2,686	45.3	41.0
Mississippi	1,560	1,493	63.5	62.6
Missouri	3,247	3,308	43.9	44.0
Montana	2,140	2,148	49.4	47.0
Nebraska	3,118	3,202	37.1	39.4
Nevada	202	194	37.6	53.1
New Hampshire	207	188	57.5	52.7
New Jersey	515	491	44.7	48.3
New Mexico	606	627	53.5	44.2
New York	1,120	1,089	53.1	52.4
North Carolina	1,765	1,762	65.2	57.3
North Dakota	2,930	2,968	42.1	35.2
Ohio	1,657	1,737	48.9	50.9
Oklahoma	2,468	2,527	58.6	54.4
Oregon	873	874	48.1	52.6
Pennsylvania	1,406	1,460	42.5	50.8
Rhode Island	63	57	28.6	24.6
South Carolina	1,075	1,010	53.7	57.2
South Dakota	2,558	2,570	44.7	41.9
Tennessee	1,401	1,399	61.4	51.8
Texas	4,529	4,567	53.4	49.0
Utah	793	763	79.6	74.2
Vermont	506	501	52.6	51.9
Virginia	1,367	1,310	60.4	50.1
Washington	1,578	1,610	44.1	38.3
West Virginia	551	541	70.6	75.8
Wisconsin	2,142	2,181	53.0	47.4
Wyoming	614	579	59.3	57.9
United States	72,603	72,615	50.1	48.3

**March Off Farm Grain Stocks Survey Sample Size and Response Rate - States and United States: 2021 and 2022**

State	Sample Size		Response Rate	
	2021 (number)	2022 (number)	2021 (percent)	2022 (percent)
Alabama	48	44	93.8	75.0
Alaska	(NA)	(NA)	(NA)	(NA)
Arizona	15	15	73.3	66.7
Arkansas	52	47	78.8	85.1
California	54	51	75.9	54.9
Colorado	43	48	76.7	56.3
Connecticut	(NA)	(NA)	(NA)	(NA)
Delaware	17	17	5.9	64.7
Florida	12	10	83.3	80.0
Georgia	88	75	92.0	80.0
Idaho	42	39	83.3	71.8
Illinois	284	275	72.5	73.1
Indiana	169	165	56.8	47.9
Iowa	293	286	90.4	85.3
Kansas	160	158	78.1	73.4
Kentucky	133	130	88.7	88.5
Louisiana	18	16	66.7	75.0
Maine	(NA)	(NA)	(NA)	(NA)
Maryland	33	31	51.5	61.3
Massachusetts	(NA)	(NA)	(NA)	(NA)
Michigan	107	103	79.4	87.4
Minnesota	288	283	66.3	53.0
Mississippi	33	29	78.8	82.8
Missouri	163	163	68.7	64.4
Montana	82	82	81.7	65.9
Nebraska	128	126	75.0	77.0
Nevada	(NA)	(NA)	(NA)	(NA)
New Hampshire <sup>1</sup>	14	14	57.1	35.7
New Jersey	4	4	75.0	50.0
New Mexico	4	5	75.0	80.0
New York	32	33	37.5	48.5
North Carolina	113	106	79.6	84.0
North Dakota	192	188	74.0	73.9
Ohio	150	146	58.7	50.7
Oklahoma	55	52	78.2	63.5
Oregon	27	28	70.4	71.4
Pennsylvania	110	105	54.5	57.1
Rhode Island	(NA)	(NA)	(NA)	(NA)
South Carolina	38	33	84.2	84.8
South Dakota	112	112	92.9	91.1
Tennessee	113	108	91.2	89.8
Texas	168	171	69.0	62.6
Utah	21	22	71.4	72.7
Vermont	(NA)	(NA)	(NA)	(NA)
Virginia	64	65	79.7	90.8
Washington	38	39	86.8	79.5
West Virginia	8	8	100.0	100.0
Wisconsin	163	153	65.0	64.7
Wyoming	12	13	83.3	61.5
United States	3,700	3,598	74.6	70.8

(NA) Not available.

<sup>1</sup> Includes data for Maine, Massachusetts, New Hampshire, and Vermont.

**June Off Farm Grain Stocks Survey Sample Size and Response Rate - States and United States: 2021 and 2022**

State	Sample Size		Response Rate	
	2021 (number)	2022 (number)	2021 (percent)	2022 (percent)
Alabama	48	44	91.7	86.4
Alaska	(NA)	(NA)	(NA)	(NA)
Arizona	16	16	68.8	50.0
Arkansas	50	46	82.0	91.3
California	54	49	85.2	61.2
Colorado	46	46	87.0	54.3
Connecticut	(NA)	(NA)	(NA)	(NA)
Delaware	17	16	11.8	62.5
Florida	12	10	83.3	70.0
Georgia	87	75	94.3	89.3
Idaho	45	43	75.6	69.8
Illinois	284	281	72.9	68.7
Indiana	170	162	53.5	53.1
Iowa	292	286	90.1	85.0
Kansas	162	159	67.9	61.0
Kentucky	132	135	87.1	88.9
Louisiana	18	16	100.0	93.8
Maine	(NA)	(NA)	(NA)	(NA)
Maryland	33	31	33.3	51.6
Massachusetts	(NA)	(NA)	(NA)	(NA)
Michigan	106	103	80.2	75.7
Minnesota	289	280	62.6	57.1
Mississippi	33	29	90.9	89.7
Missouri	162	161	65.4	65.8
Montana	85	81	80.0	69.1
Nebraska	130	125	73.1	76.8
Nevada	(NA)	(NA)	(NA)	(NA)
New Hampshire <sup>1</sup>	14	14	42.9	42.9
New Jersey	4	4	75.0	100.0
New Mexico	4	6	100.0	50.0
New York	30	32	53.3	53.1
North Carolina	112	108	75.9	86.1
North Dakota	190	187	71.6	70.6
Ohio	150	145	68.0	64.8
Oklahoma	51	54	70.6	63.0
Oregon	28	29	67.9	65.5
Pennsylvania	109	106	51.4	42.5
Rhode Island	(NA)	(NA)	(NA)	(NA)
South Carolina	38	34	81.6	73.5
South Dakota	112	113	94.6	87.6
Tennessee	112	106	88.4	90.6
Texas	170	170	65.3	65.9
Utah	22	21	77.3	76.2
Vermont	(NA)	(NA)	(NA)	(NA)
Virginia	64	62	65.6	83.9
Washington	42	43	78.6	72.1
West Virginia	8	8	87.5	87.5
Wisconsin	162	151	63.0	57.6
Wyoming	13	12	92.3	58.3
United States	3,706	3,599	73.2	70.2

(NA) Not available.

<sup>1</sup> Includes data for Maine, Massachusetts, New Hampshire, and Vermont.

**September Off Farm Grain Stocks Survey Sample Size and Response Rate - States and United States: 2021 and 2022**

State	Sample Size		Response Rate	
	2021 (number)	2022 (number)	2021 (percent)	2022 (percent)
Alabama	48	44	91.7	97.7
Alaska	(NA)	(NA)	(NA)	(NA)
Arizona	16	16	68.8	37.5
Arkansas	51	46	82.4	89.1
California	55	49	60.0	67.3
Colorado	47	48	68.1	47.9
Connecticut	(NA)	(NA)	(NA)	(NA)
Delaware	17	16	29.4	68.8
Florida	12	11	100.0	90.9
Georgia	87	75	94.3	86.7
Idaho	41	39	70.7	71.8
Illinois	275	270	71.6	77.0
Indiana	169	163	55.0	54.0
Iowa	290	283	83.1	86.9
Kansas	158	155	73.4	74.8
Kentucky	137	134	92.0	85.8
Louisiana	16	16	56.3	93.8
Maine	(NA)	(NA)	(NA)	(NA)
Maryland	33	31	42.4	58.1
Massachusetts	(NA)	(NA)	(NA)	(NA)
Michigan	106	102	90.6	92.2
Minnesota	289	278	65.7	65.1
Mississippi	31	28	67.7	82.1
Missouri	162	162	60.5	65.4
Montana	86	77	75.6	61.0
Nebraska	129	125	57.4	72.8
Nevada	(NA)	(NA)	(NA)	(NA)
New Hampshire <sup>1</sup>	14	14	21.4	28.6
New Jersey	4	4	75.0	100.0
New Mexico	4	5	75.0	60.0
New York	30	33	66.7	45.5
North Carolina	109	105	76.1	80.0
North Dakota	192	187	76.0	71.1
Ohio	149	146	63.1	61.0
Oklahoma	53	53	86.8	64.2
Oregon	28	28	60.7	64.3
Pennsylvania	109	105	64.2	53.3
Rhode Island	(NA)	(NA)	(NA)	(NA)
South Carolina	38	34	89.5	79.4
South Dakota	110	113	89.1	88.5
Tennessee	112	106	91.1	91.5
Texas	173	172	61.8	60.5
Utah	23	21	73.9	61.9
Vermont	(NA)	(NA)	(NA)	(NA)
Virginia	67	63	91.0	88.9
Washington	38	39	60.5	64.1
West Virginia	8	8	100.0	75.0
Wisconsin	160	149	62.5	64.4
Wyoming	11	13	72.7	30.8
United States	3,687	3,566	72.5	72.2

(NA) Not available.

<sup>1</sup> Includes data for Maine, Massachusetts, New Hampshire, and Vermont.

**December Off Farm Grain Stocks Survey Sample Size and Response Rate - States and United States: 2021 and 2022**

State	Sample Size		Response Rate	
	2021 (number)	2022 (number)	2021 (percent)	2022 (percent)
Alabama	47	48	83.0	93.8
Alaska	(NA)	(NA)	(NA)	(NA)
Arizona	15	16	60.0	25.0
Arkansas	50	45	82.0	82.2
California	55	52	54.5	59.6
Colorado	46	47	63.0	57.4
Connecticut	(NA)	(NA)	(NA)	(NA)
Delaware	17	16	29.4	31.3
Florida	10	13	70.0	92.3
Georgia	82	84	87.8	86.9
Idaho	42	46	73.8	60.9
Illinois	285	268	72.3	74.3
Indiana	166	165	51.8	52.7
Iowa	289	280	89.3	88.6
Kansas	160	149	64.4	72.5
Kentucky	137	130	89.1	86.2
Louisiana	17	15	82.4	93.3
Maine	(NA)	(NA)	(NA)	(NA)
Maryland	31	31	41.9	41.9
Massachusetts	(NA)	(NA)	(NA)	(NA)
Michigan	106	103	91.5	93.2
Minnesota	282	280	63.1	63.9
Mississippi	31	28	90.3	82.1
Missouri	164	161	62.8	64.0
Montana	79	74	79.7	40.5
Nebraska	129	127	72.1	72.4
Nevada	(NA)	(NA)	(NA)	(NA)
New Hampshire <sup>1</sup>	14	13	21.4	46.2
New Jersey	4	4	50.0	75.0
New Mexico	5	5	80.0	40.0
New York	33	31	45.5	45.2
North Carolina	107	104	81.3	80.8
North Dakota	188	179	70.7	64.2
Ohio	147	147	56.5	57.1
Oklahoma	52	49	67.3	67.3
Oregon	27	30	74.1	63.3
Pennsylvania	106	106	63.2	52.8
Rhode Island	(NA)	(NA)	(NA)	(NA)
South Carolina	36	35	86.1	74.3
South Dakota	111	112	95.5	92.9
Tennessee	105	108	93.3	87.0
Texas	172	168	61.0	62.5
Utah	21	21	85.7	52.4
Vermont	(NA)	(NA)	(NA)	(NA)
Virginia	63	63	92.1	90.5
Washington	44	43	77.3	55.8
West Virginia	8	8	100.0	100.0
Wisconsin	157	149	60.5	63.8
Wyoming	11	14	72.7	42.9
United States	3,651	3,567	72.2	70.4

(NA) Not available.

<sup>1</sup> Includes data for Maine, Massachusetts, New Hampshire, and Vermont.

## Quality Metrics from the Agricultural Survey by Crop and Date - United States: 2021 and 2022

Date	Weighted Item Response Rate		Coefficient of Variation	
	2021	2022	2021	2022
	(percent)	(percent)	(percent)	(percent)
<b>Corn Stocks</b>				
March 1	46.1	40.0	1.8	2.0
June 1	33.5	33.2	3.1	2.8
September 1	32.6	30.9	3.6	4.1
December 1	42.5	41.9	1.6	1.8
<b>Soybeans Stocks</b>				
March 1	45.0	39.8	2.7	2.8
June 1	34.2	32.6	4.2	5.1
September 1	31.2	27.2	5.9	6.4
December 1	43.1	43.0	2.1	2.1
<b>All Wheat Stocks</b>				
March 1	37.8	34.8	3.0	3.5
June 1	26.5	23.7	4.5	4.0
September 1	36.1	34.5	2.9	2.6
December 1	35.7	33.3	2.6	2.6

## Quality Metrics from Off Farm Grain Stocks Survey by Crop and Date - United States: 2021 and 2022

Date	Weighted Item Response Rate		Coefficient of Variation	
	2021	2022	2021	2022
	(percent)	(percent)	(percent)	(percent)
<b>Corn Stocks</b>				
March 1	83.6	85.0	0.3	0.3
June 1	81.2	81.9	0.2	0.2
September 1	78.5	80.8	0.4	0.5
December 1	80.1	82.5	0.2	0.2
<b>Soybeans Stocks</b>				
March 1	86.3	89.5	0.2	0.3
June 1	83.4	85.2	0.3	0.3
September 1	83.1	83.9	0.4	0.3
December 1	84.2	85.8	0.2	0.3
<b>All Wheat Stocks</b>				
March 1	80.7	81.6	0.4	0.6
June 1	77.6	74.4	0.7	0.8
September 1	80.3	80.2	0.4	0.4
December 1	81.5	76.9	0.5	0.9

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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
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