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 4.4% for corn stocks, from 1.7% to 11.0% for soybean stocks, and from 2.3% 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: 2022 and 2023

State	Sample Size		Response Rate	
	2022	2023	2022	2023
	(number)	(number)	(percent)	(percent)
Alabama	781	749	58.8	67.0
Alaska	116	121	53.4	52.1
Arizona	342	331	64.3	56.5
Arkansas	1,716	1,681	57.1	57.6
California	2,150	1,962	43.2	40.0
Colorado	1,965	1,901	41.1	41.2
Connecticut	297	265	43.1	53.6
Delaware	366	363	44.5	38.3
Florida	628	583	45.9	44.1
Georgia	1,361	1,381	45.4	47.6
Idaho	1,791	1,864	51.2	44.8
Illinois	2,526	2,594	50.1	51.8
Indiana	2,254	2,346	47.4	45.7
Iowa	2,632	2,690	42.5	49.3
Kansas	3,698	3,761	39.3	36.0
Kentucky	1,515	1,520	58.5	53.4
Louisiana	1,052	943	64.2	62.0
Maine	393	393	51.9	59.5
Maryland	1,008	990	46.3	48.2
Massachusetts	292	295	56.5	57.6
Michigan	1,744	1,822	56.8	54.8
Minnesota	2,931	2,861	43.2	46.9
Mississippi	1,344	1,332	60.5	59.3
Missouri	3,156	3,226	44.0	43.8
Montana	2,279	2,277	46.2	43.7
Nebraska	3,486	3,522	38.6	41.4
Nevada	207	193	47.3	40.4
New Hampshire	213	201	49.8	58.2
New Jersey	413	389	54.2	52.7
New Mexico	508	532	53.0	44.4
New York	1,216	1,204	51.3	52.7
North Carolina	1,623	1,666	64.7	51.7
North Dakota	3,091	3,173	42.4	39.1
Ohio	1,689	1,787	47.5	53.9
Oklahoma	2,271	2,251	59.0	56.8
Oregon	1,153	1,134	52.0	47.2
Pennsylvania	1,541	1,522	48.7	51.2
Rhode Island	59	53	28.8	56.6
South Carolina	929	860	55.1	61.0
South Dakota	2,764	2,794	42.3	41.8
Tennessee	1,255	1,250	60.2	55.5
Texas	4,413	4,490	53.2	50.4
Utah	830	762	72.7	68.0
Vermont	493	492	55.0	63.2
Virginia	1,385	1,346	61.4	54.1
Washington	1,706	1,708	42.8	35.6
West Virginia	468	479	72.2	73.3
Wisconsin	2,000	1,995	51.6	52.0
Wyoming	904	831	55.4	52.8
United States	72,954	72,885	49.4	48.4

June Agricultural Survey Sample Size and Response Rate - States and United States: 2022 and 2023

State	Sample Size		Response Rate	
	2022	2023	2022	2023
	(number)	(number)	(percent)	(percent)
Alabama	1,056	1,045	44.6	52.7
Alaska	76	80	50.0	55.0
Arizona	284	259	58.8	64.1
Arkansas	1,551	1,503	49.8	43.4
California	1,701	1,660	41.6	39.1
Colorado	1,643	1,622	35.4	37.8
Connecticut	82	87	48.8	37.9
Delaware	298	294	33.2	33.3
Florida	405	386	37.8	42.7
Georgia	1,481	1,445	36.2	38.8
Idaho	1,612	1,583	42.2	41.2
Illinois	2,194	2,207	41.9	39.1
Indiana	2,011	1,920	38.1	33.7
Iowa	2,141	2,123	39.6	38.0
Kansas	3,913	3,908	31.1	28.6
Kentucky	1,676	1,639	59.6	44.0
Louisiana	1,052	971	57.7	51.3
Maine	253	235	45.5	51.1
Maryland	841	829	36.7	41.3
Massachusetts	96	88	49.0	46.6
Michigan	1,721	1,690	44.7	36.6
Minnesota	2,344	2,367	32.0	40.3
Mississippi	1,178	1,177	56.6	47.6
Missouri	2,512	2,547	39.1	37.5
Montana	1,788	1,760	45.0	40.5
Nebraska	3,042	3,091	33.1	29.1
Nevada	186	188	34.4	47.3
New Hampshire	64	60	51.6	56.7
New Jersey	372	363	41.9	54.8
New Mexico	543	541	40.5	41.8
New York	1,109	1,109	43.0	45.0
North Carolina	1,467	1,422	61.6	46.3
North Dakota	2,635	2,660	26.5	26.2
Ohio	1,515	1,522	37.5	38.0
Oklahoma	2,224	2,113	54.6	50.4
Oregon	891	920	46.6	45.0
Pennsylvania	1,413	1,430	44.0	41.3
Rhode Island	19	19	47.4	10.5
South Carolina	880	873	42.2	49.6
South Dakota	2,660	2,590	32.9	28.8
Tennessee	1,305	1,244	55.6	51.5
Texas	3,459	3,564	51.7	46.3
Utah	627	576	57.9	57.5
Vermont	176	179	43.8	58.1
Virginia	1,169	1,203	42.6	43.9
Washington	1,373	1,484	39.3	38.1
West Virginia	386	370	53.4	62.2
Wisconsin	2,053	2,026	45.9	45.6
Wyoming	771	764	40.1	50.8
United States	64,248	63,736	42.2	40.2

September Agricultural Survey Sample Size and Response Rate - States and United States: 2022 and 2023

State	Sample Size		Response Rate	
	2022	2023	2022	2023
	(number)	(number)	(percent)	(percent)
Alabama	782	717	61.3	60.7
Alaska	147	148	43.5	61.5
Arizona	317	298	63.1	72.1
Arkansas	1,206	1,274	53.8	54.4
California	1,440	1,394	41.0	45.1
Colorado	1,142	1,084	43.8	41.7
Connecticut	(NA)	(NA)	(NA)	(NA)
Delaware	239	231	33.1	42.9
Florida	409	407	48.2	47.7
Georgia	1,130	1,123	50.4	46.8
Idaho	1,325	1,399	40.2	50.2
Illinois	2,330	2,332	51.4	46.0
Indiana	2,028	1,960	47.9	46.2
Iowa	2,631	2,642	45.3	41.5
Kansas	2,612	2,531	37.9	39.1
Kentucky	1,142	1,127	61.7	58.4
Louisiana	867	921	67.1	61.9
Maine	230	216	59.1	57.9
Maryland	699	687	42.6	53.4
Massachusetts	(NA)	(NA)	(NA)	(NA)
Michigan	1,395	1,390	53.2	48.9
Minnesota	2,138	2,105	40.5	40.3
Mississippi	1,181	1,159	63.7	61.3
Missouri	2,470	2,426	44.0	40.7
Montana	1,873	1,847	47.9	46.0
Nebraska	2,246	2,311	45.5	41.4
Nevada	(NA)	(NA)	(NA)	(NA)
New Hampshire	(NA)	(NA)	(NA)	(NA)
New Jersey	332	330	52.4	53.0
New Mexico	517	530	46.2	52.1
New York	927	962	53.8	49.4
North Carolina	1,110	1,152	64.8	56.9
North Dakota	2,457	2,513	42.3	40.0
Ohio	1,420	1,374	50.2	47.1
Oklahoma	2,167	2,258	59.1	56.2
Oregon	741	758	41.2	50.0
Pennsylvania	1,189	1,165	52.1	57.1
Rhode Island	(NA)	(NA)	(NA)	(NA)
South Carolina	870	855	61.5	60.8
South Dakota	2,348	2,294	44.8	38.9
Tennessee	994	1,009	60.7	58.5
Texas	3,192	3,291	52.8	49.7
Utah	632	594	72.2	73.6
Vermont	(NA)	(NA)	(NA)	(NA)
Virginia	900	899	59.6	55.6
Washington	1,307	1,292	31.3	42.5
West Virginia	361	311	75.9	78.8
Wisconsin	2,076	2,063	50.1	43.0
Wyoming	483	508	52.6	49.8
United States	56,002	55,887	49.5	48.2

(NA) Not available.

December Agricultural Survey Sample Size and Response Rate - States and United States: 2022 and 2023

State	Sample Size		Response Rate	
	2022	2023	2022	2023
	(number)	(number)	(percent)	(percent)
Alabama	982	954	63.2	66.9
Alaska	179	170	45.8	62.9
Arizona	387	385	64.9	71.4
Arkansas	1,815	1,812	57.4	56.2
California	2,054	2,069	41.2	50.1
Colorado	1,560	1,508	42.4	44.4
Connecticut	229	239	57.6	41.0
Delaware	370	371	35.1	32.6
Florida	751	703	47.3	45.4
Georgia	1,606	1,623	49.8	43.2
Idaho	1,702	1,695	49.7	48.0
Illinois	2,584	2,619	49.7	42.9
Indiana	2,489	2,464	45.3	41.2
Iowa	2,862	2,896	45.8	40.0
Kansas	2,988	2,993	36.0	33.6
Kentucky	1,572	1,569	56.3	55.6
Louisiana	1,332	1,316	61.6	61.9
Maine	340	348	56.2	55.2
Maryland	971	936	42.8	44.0
Massachusetts	280	253	62.1	68.8
Michigan	1,720	1,725	54.3	46.0
Minnesota	2,686	2,687	41.0	35.5
Mississippi	1,493	1,428	62.6	58.2
Missouri	3,308	3,241	44.0	39.1
Montana	2,148	2,127	47.0	47.9
Nebraska	3,202	3,205	39.4	37.0
Nevada	194	166	53.1	53.0
New Hampshire	188	174	52.7	52.3
New Jersey	491	477	48.3	45.9
New Mexico	627	635	44.2	51.3
New York	1,089	1,072	52.4	39.5
North Carolina	1,762	1,776	57.3	55.7
North Dakota	2,968	3,083	35.2	38.9
Ohio	1,737	1,739	50.9	45.8
Oklahoma	2,527	2,540	54.4	50.1
Oregon	874	845	52.6	52.0
Pennsylvania	1,460	1,445	50.8	44.6
Rhode Island	57	58	24.6	39.7
South Carolina	1,010	983	57.2	58.6
South Dakota	2,570	2,587	41.9	31.9
Tennessee	1,399	1,452	51.8	52.4
Texas	4,567	4,523	49.0	43.8
Utah	763	752	74.2	77.3
Vermont	501	477	51.9	48.6
Virginia	1,310	1,288	50.1	50.5
Washington	1,610	1,541	38.3	45.9
West Virginia	541	500	75.8	76.4
Wisconsin	2,181	2,170	47.4	41.1
Wyoming	579	620	57.9	56.8
United States	72,615	72,239	48.3	45.8

March Off Farm Grain Stocks Survey Sample Size and Response Rate - States and United States: 2022 and 2023

State	Sample Size		Response Rate	
	2022	2023	2022	2023
	(number)	(number)	(percent)	(percent)
Alabama	44	47	75.0	83.0
Alaska	(NA)	(NA)	(NA)	(NA)
Arizona	15	16	66.7	37.5
Arkansas	47	46	85.1	84.8
California	51	52	54.9	63.5
Colorado	48	48	56.3	54.2
Connecticut	(NA)	(NA)	(NA)	(NA)
Delaware	17	16	64.7	68.8
Florida	10	13	80.0	84.6
Georgia	75	84	80.0	86.9
Idaho	39	39	71.8	79.5
Illinois	275	271	73.1	72.3
Indiana	165	164	47.9	39.6
Iowa	286	277	85.3	90.3
Kansas	158	147	73.4	78.2
Kentucky	130	135	88.5	86.7
Louisiana	16	16	75.0	93.8
Maine	(NA)	(NA)	(NA)	(NA)
Maryland	31	31	61.3	54.8
Massachusetts	(NA)	(NA)	(NA)	(NA)
Michigan	103	101	87.4	91.1
Minnesota	283	279	53.0	58.8
Mississippi	29	29	82.8	72.4
Missouri	163	161	64.4	62.7
Montana	82	74	65.9	59.5
Nebraska	126	124	77.0	81.5
Nevada	(NA)	(NA)	(NA)	(NA)
New Hampshire [1]	14	13	35.7	46.2
New Jersey	(D)	(D)	(D)	(D)
New Mexico	(D)	(D)	(D)	(D)
New York	33	32	48.5	28.1
North Carolina	106	104	84.0	82.7
North Dakota	188	183	73.9	71.6
Ohio	146	144	50.7	50.0
Oklahoma	52	47	63.5	59.6
Oregon	28	29	71.4	69.0
Pennsylvania	105	102	57.1	59.8
Rhode Island	(NA)	(NA)	(NA)	(NA)
South Carolina	33	35	84.8	80.0
South Dakota	112	110	91.1	93.6
Tennessee	108	110	89.8	87.3
Texas	171	163	62.6	74.2
Utah	22	21	72.7	71.4
Vermont	(NA)	(NA)	(NA)	(NA)
Virginia	65	63	90.8	88.9
Washington	39	40	79.5	67.5
West Virginia	8	8	100.0	75.0
Wisconsin	153	147	64.7	61.9
Wyoming	13	14	61.5	57.1
United States	3,598	3,545	70.8	71.5

(D) Withheld to avoid disclosing data for individual operations.
(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: 2022 and 2023

State	Sample Size		Response Rate	
	2022	2023	2022	2023
	(number)	(number)	(percent)	(percent)
Alabama	44	45	86.4	88.9
Alaska	(NA)	(NA)	(NA)	(NA)
Arizona	16	15	50.0	46.7
Arkansas	46	43	91.3	86.0
California	49	54	61.2	40.7
Colorado	46	46	54.3	47.8
Connecticut	(NA)	(NA)	(NA)	(NA)
Delaware	16	15	62.5	60.0
Florida	10	11	70.0	90.9
Georgia	75	77	89.3	84.4
Idaho	43	44	69.8	59.1
Illinois	281	270	68.7	74.4
Indiana	162	165	53.1	44.2
Iowa	286	277	85.0	83.8
Kansas	159	146	61.0	69.2
Kentucky	135	133	88.9	86.5
Louisiana	16	15	93.8	93.3
Maine	(NA)	(NA)	(NA)	(NA)
Maryland	31	30	51.6	73.3
Massachusetts	(NA)	(NA)	(NA)	(NA)
Michigan	103	101	75.7	91.1
Minnesota	280	277	57.1	55.6
Mississippi	29	29	89.7	72.4
Missouri	161	161	65.8	61.5
Montana	81	79	69.1	40.5
Nebraska	125	122	76.8	78.7
Nevada	(NA)	(NA)	(NA)	(NA)
New Hampshire [1]	14	13	42.9	30.8
New Jersey	(D)	(D)	(D)	(D)
New Mexico	(D)	(D)	(D)	(D)
New York	32	32	53.1	43.8
North Carolina	108	103	86.1	80.6
North Dakota	187	179	70.6	68.7
Ohio	145	146	64.8	47.3
Oklahoma	54	49	63.0	61.2
Oregon	29	29	65.5	65.5
Pennsylvania	106	101	42.5	58.4
Rhode Island	(NA)	(NA)	(NA)	(NA)
South Carolina	34	34	73.5	82.4
South Dakota	113	109	87.6	91.7
Tennessee	106	109	90.6	85.3
Texas	170	167	65.9	70.1
Utah	21	22	76.2	54.5
Vermont	(NA)	(NA)	(NA)	(NA)
Virginia	62	63	83.9	88.9
Washington	43	45	72.1	51.1
West Virginia	8	8	87.5	87.5
Wisconsin	151	145	57.6	66.9
Wyoming	12	14	58.3	42.9
United States	3,599	3,531	70.2	69.0

(D) Withheld to avoid disclosing data for individual operations.
(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: 2022 and 2023

State	Sample Size		Response Rate	
	2022	2023	2022	2023
	(number)	(number)	(percent)	(percent)
Alabama	44	44	97.7	86.4
Alaska	(NA)	(NA)	(NA)	(NA)
Arizona	16	15	37.5	53.3
Arkansas	46	44	89.1	88.6
California	49	53	67.3	56.6
Colorado	48	47	47.9	53.2
Connecticut	(NA)	(NA)	(NA)	(NA)
Delaware	16	15	68.8	80.0
Florida	11	11	90.9	81.8
Georgia	75	76	86.7	86.8
Idaho	39	41	71.8	70.7
Illinois	270	265	77.0	70.6
Indiana	163	163	54.0	43.6
Iowa	283	273	86.9	86.1
Kansas	155	146	74.8	61.0
Kentucky	134	139	85.8	87.1
Louisiana	16	15	93.8	93.3
Maine	(NA)	(NA)	(NA)	(NA)
Maryland	31	31	58.1	58.1
Massachusetts	(NA)	(NA)	(NA)	(NA)
Michigan	102	100	92.2	88.0
Minnesota	278	266	65.1	62.0
Mississippi	28	29	82.1	79.3
Missouri	162	161	65.4	58.4
Montana	77	72	61.0	59.7
Nebraska	125	124	72.8	65.3
Nevada	(NA)	(NA)	(NA)	(NA)
New Hampshire [1]	14	13	28.6	23.1
New Jersey	(D)	(D)	(D)	(D)
New Mexico	(D)	(D)	(D)	(D)
New York	33	31	45.5	38.7
North Carolina	105	102	80.0	85.3
North Dakota	187	180	71.1	74.4
Ohio	146	142	61.0	50.0
Oklahoma	53	48	64.2	62.5
Oregon	28	30	64.3	63.3
Pennsylvania	105	102	53.3	60.8
Rhode Island	(NA)	(NA)	(NA)	(NA)
South Carolina	34	34	79.4	82.4
South Dakota	113	112	88.5	88.4
Tennessee	106	104	91.5	84.6
Texas	172	165	60.5	69.1
Utah	21	20	61.9	55.0
Vermont	(NA)	(NA)	(NA)	(NA)
Virginia	63	64	88.9	79.7
Washington	39	41	64.1	63.4
West Virginia	8	9	75.0	88.9
Wisconsin	149	142	64.4	64.1
Wyoming	13	12	30.8	66.7
United States	3,566	3,491	72.2	69.7

(D) Withheld to avoid disclosing data for individual operations.
(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: 2022 and 2023

State	Sample Size		Response Rate	
	2022	2023	2022	2023
	(number)	(number)	(percent)	(percent)
Alabama	48	46	93.8	73.9
Alaska	(NA)	(NA)	(NA)	(NA)
Arizona	16	16	25.0	43.8
Arkansas	45	43	82.2	88.4
California	52	52	59.6	48.1
Colorado	47	46	57.4	52.2
Connecticut	(NA)	(NA)	(NA)	(NA)
Delaware	16	15	31.3	26.7
Florida	13	13	92.3	84.6
Georgia	84	86	86.9	84.9
Idaho	46	45	60.9	71.1
Illinois	268	265	74.3	72.5
Indiana	165	163	52.7	47.2
Iowa	280	270	88.6	84.4
Kansas	149	143	72.5	73.4
Kentucky	130	145	86.2	91.0
Louisiana	15	15	93.3	100.0
Maine	(NA)	(NA)	(NA)	(NA)
Maryland	31	31	41.9	48.4
Massachusetts	(NA)	(NA)	(NA)	(NA)
Michigan	103	103	93.2	88.3
Minnesota	280	264	63.9	62.5
Mississippi	28	29	82.1	69.0
Missouri	161	161	64.0	61.5
Montana	74	72	40.5	58.3
Nebraska	127	118	72.4	74.6
Nevada	(NA)	(NA)	(NA)	(NA)
New Hampshire [1]	13	13	46.2	38.5
New Jersey	(D)	(D)	(D)	(D)
New Mexico	(D)	(D)	(D)	(D)
New York	31	31	45.2	38.7
North Carolina	104	103	80.8	80.6
North Dakota	179	177	64.2	68.4
Ohio	147	144	57.1	47.9
Oklahoma	49	45	67.3	86.7
Oregon	30	30	63.3	53.3
Pennsylvania	106	98	52.8	54.1
Rhode Island	(NA)	(NA)	(NA)	(NA)
South Carolina	35	35	74.3	68.6
South Dakota	112	108	92.9	93.5
Tennessee	108	110	87.0	90.0
Texas	168	164	62.5	61.6
Utah	21	20	52.4	55.0
Vermont	(NA)	(NA)	(NA)	(NA)
Virginia	63	64	90.5	82.8
Washington	43	45	55.8	66.7
West Virginia	8	9	100.0	66.7
Wisconsin	149	147	63.8	59.9
Wyoming	14	13	42.9	69.2
United States	3,567	3,506	70.4	69.7

(D) Withheld to avoid disclosing data for individual operations.
(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: 2022 and 2023

Date	Weighted Item Response Rate		Coefficient of Variation	
	2022	2023	2022	2023
	(percent)	(percent)	(percent)	(percent)
Corn Stocks				
March 1	40.0	42.0	2.0	2.0
June 1	33.2	31.0	2.8	2.6
September 1	30.9	28.3	4.1	3.0
December 1	41.9	37.6	1.8	1.7
Soybeans Stocks				
March 1	39.8	41.1	2.8	2.5
June 1	32.6	30.3	5.1	4.1
September 1	27.2	29.5	6.4	5.3
December 1	43.0	37.3	2.1	2.0
All Wheat Stocks				
March 1	34.8	33.3	3.5	2.7
June 1	23.7	22.3	4.0	4.1
September 1	34.5	33.8	2.6	2.5
December 1	33.3	34.9	2.6	3.6

Quality Metrics from Off Farm Grain Stocks Survey by Crop and Date - United States: 2022 and 2023

Date	Weighted Item Response Rate		Coefficient of Variation	
	2022	2023	2022	2023
	(percent)	(percent)	(percent)	(percent)
Corn Stocks				
March 1	85.0	82.8	0.3	0.2
June 1	81.9	80.6	0.2	0.2
September 1	80.8	78.3	0.5	0.4
December 1	82.5	81.2	0.2	0.2
Soybeans Stocks				
March 1	89.5	86.0	0.3	0.2
June 1	85.2	80.0	0.3	0.3
September 1	83.9	80.8	0.3	0.5
December 1	85.8	83.7	0.3	0.2
All Wheat Stocks				
March 1	81.6	83.1	0.6	0.5
June 1	74.4	75.8	0.8	0.8
September 1	80.2	73.4	0.4	0.3
December 1	76.9	78.4	0.9	0.4

Information Contacts

Process	Unit	Telephone	Email
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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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