Annual Crop Production Methodology and Quality Measures

Scope and Purpose: Estimates of row crops acreage and production are derived from the Agricultural Survey. The Agricultural Survey is a quarterly survey (March, June, September, and December) conducted in all states, except Hawaii, but the estimates that are published in the Annual Crop Production Summary are all collected during the December survey. The Agricultural Survey also collects on farm grain stocks and storage capacity 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 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 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 December Agricultural survey is the first of the month 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 prepares the official estimates for release in 5 or 6 business days. The Annual Crop Production Summary is released at the beginning of January. The publication contains annual U.S. data for acreage and production for corn, cotton, hay, soybeans, and other row crops.

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, storage capacity, and other agricultural data of each farm are 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 cropland 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 sampling 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 the June Area Survey (JAS). 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 JAS. 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 data for multiple specified commodities. The MPPS design makes it very easy to target sample sizes for the commodities of interest. It is an 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 winter wheat acreage equals the sum of the population list frame data. 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 acreage estimates. The CV is defined as the ratio of the standard error to the estimate expressed as a percentage. At the U.S. level, the planted acres target CV for corn is 1%, the soybean target CV is 1%, and the cotton target CV is 3%. 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 1.0% to 1.3% for corn, from 1.0% to 1.3% for soybeans, and 2.0% to 3.7% for cotton.

Data Collection: All Regional Field Offices (RFO) use the same standard 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 acreage and production 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.

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 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 the Agricultural Survey 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 acreage and production are to be made. For the Agricultural Survey, nonrespondents are accounted for by imputing data where there are missing values.

The imputation program imputes for missing survey data using previously reported survey data or 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.

Cropland is imputed first for the nonrespondent. When available, previously reported cropland is used. Otherwise, the weighted ratio of current survey cropland to the list frame data value for cropland is calculated from the respondents in an imputation group. This ratio is applied to the nonrespondent's frame cropland to derive the imputed value for the current survey. If the nonrespondent does not have previously reported or list frame cropland, the weighted mean value of the respondents in an imputation group is used to impute. Missing crop acres are imputed similarly by applying the respondents' weighted ratio of crop acres to cropland within each imputation group to the nonrespondent's reported or imputed cropland. Production is imputed by applying the weighted mean yield of the respondents in the imputation group to the nonrespondent's reported or imputed harvested acres. An imputation group must have 20 or more respondents before it is used to impute acres and five or more respondents before it is used to impute production. 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 acreage and production in the Agricultural Survey: direct expansions and ratio estimators. Direct expansions are used to estimate totals such as total harvested acres and production. 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 acreage and production estimates. U.S. level CVs from the Agricultural Survey for the last two years are displayed in the tables on pages 7 through 12 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., Yield and Current to Previous Acres). 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.

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 planting or harvesting 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. In order to be considered, these data must be deemed to be reliable and come from unbiased sources. Thus, they are often of limited use prior to the end of the season. The most common administrative data are the certified acreage data from USDA's Farm Service Agency. However, data from many different sources are utilized.

Estimates are open to revision the following year only if new information becomes available. Estimates will also be reviewed following the 5-year 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 Annual Crop Production Summary

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. The Agricultural Survey CVs measure the error due to sampling as well as some nonsampling error. Nonsampling error is also evaluated by examining survey 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.

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

State	Sample Size		Response Rate	
	2021	2022	2021	2022
	(number)	(number)	(percent)	(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

Quality Metrics for Corn Area Harvested for Grain - States and United States: 2021 and 2022

State	Weighted Item Response Rate [1]		Coefficient of Variation [2]	
	2021	2022	2021	2022
	(percent)	(percent)	(percent)	(percent)
Alabama	57.8	65.6	0.5	0.6
Arizona	50.3	91.8	20.4	9.6
Arkansas	49.0	58.6	0.5	0.4
California	67.4	50.4	44.9	46.2
Colorado	40.8	43.4	2.2	5.9
Connecticut	(NA)	(NA)	(NA)	(NA)
Delaware	38.2	26.6	0.2	1.0
Florida	39.0	64.1	11.4	11.5
Georgia	44.9	49.6	1.7	1.3
Idaho	39.1	43.4	15.9	14.9
Illinois	50.3	50.8	0.1	0.3
Indiana	47.1	39.9	0.4	0.2
Iowa	42.9	42.3	0.3	0.4
Kansas	35.9	35.3	1.0	1.8
Kentucky	49.3	51.5	0.6	0.6
Louisiana	55.5	55.4	0.2	0.3
Maine	(NA)	(NA)	(NA)	(NA)
Maryland	31.0	39.6	1.3	3.1
Massachusetts	(NA)	(NA)	(NA)	(NA)
Michigan	53.1	51.4	0.9	1.4
Minnesota	44.9	38.4	0.5	0.7
Mississippi	63.9	65.2	0.5	0.6
Missouri	40.8	42.1	0.7	1.5
Montana	50.9	43.3	7.2	8.9
Nebraska	37.2	39.0	0.3	1.0
Nevada	(NA)	(NA)	(NA)	(NA)
New Hampshire	(NA)	(NA)	(NA)	(NA)
New Jersey	30.4	47.7	1.3	3.2
New Mexico	24.2	25.4	15.6	10.8
New York	50.4	47.6	5.6	5.9
North Carolina	63.7	54.2	1.0	1.2
North Dakota	44.7	41.1	1.6	4.9
Ohio	44.0	48.0	0.6	0.8
Oklahoma	57.5	40.4	4.1	17.0
Oregon	35.9	63.7	8.2	7.5
Pennsylvania	40.8	48.4	2.7	2.6
Rhode Island	(NA)	(NA)	(NA)	(NA)
South Carolina	56.0	65.9	2.1	0.9
South Dakota	42.2	37.1	0.9	1.7
Tennessee	60.8	53.7	0.9	0.8
Texas	44.4	43.3	2.9	5.1
Utah	78.4	75.0	16.9	36.4
Vermont	(NA)	(NA)	(NA)	(NA)
Virginia	59.1	50.9	5.3	3.0
Washington	51.1	46.7	13.7	10.9
West Virginia	73.7	82.9	2.7	4.9
Wisconsin	47.6	44.0	1.9	2.0
Wyoming	52.2	48.1	6.5	10.7
United States	44.9	43.7	0.2	0.4

(NA) Not available.

[1] Weighted item response rate based on harvested acres.

[2] CV for the ratio of harvested acres to planted acres.

Quality Metrics for Corn for Grain Production and Yield - States and United States: 2021 and 2022

State	Weighted Item Response Rate [1]		Coefficient of Variation [2]	
	2021	2022	2021	2022
	(percent)	(percent)	(percent)	(percent)
Alabama	53.1	63.4	2.4	3.1
Arizona	13.7	91.4	15.3	0.2
Arkansas	47.8	53.3	0.9	1.0
California	69.7	46.0	8.8	6.4
Colorado	41.2	39.8	4.8	6.7
Connecticut	(NA)	(NA)	(NA)	(NA)
Delaware	25.3	22.7	2.5	4.2
Florida	37.2	59.2	11.2	5.8
Georgia	43.4	46.7	2.4	1.2
Idaho	41.5	37.4	2.9	5.3
Illinois	47.4	47.6	0.6	0.6
Indiana	41.4	37.2	0.6	0.7
Iowa	41.2	39.6	0.9	0.9
Kansas	32.3	32.5	2.5	3.7
Kentucky	45.9	47.0	0.8	1.7
Louisiana	53.4	51.6	1.7	2.1
Maine	(NA)	(NA)	(NA)	(NA)
Maryland	29.4	25.1	1.4	1.5
Massachusetts	(NA)	(NA)	(NA)	(NA)
Michigan	47.6	46.4	1.3	2.0
Minnesota	42.2	37.5	1.2	0.9
Mississippi	63.2	62.6	0.8	1.9
Missouri	37.3	39.7	2.3	1.8
Montana	48.9	37.2	18.4	24.7
Nebraska	35.5	35.9	0.8	2.3
Nevada	(NA)	(NA)	(NA)	(NA)
New Hampshire	(NA)	(NA)	(NA)	(NA)
New Jersey	26.3	31.8	3.5	4.3
New Mexico	25.5	26.5	6.8	28.4
New York	42.1	40.4	1.6	6.1
North Carolina	62.2	51.1	1.1	2.2
North Dakota	42.5	39.4	3.8	2.3
Ohio	40.2	44.5	0.9	0.8
Oklahoma	52.4	39.5	4.5	8.8
Oregon	34.9	30.0	4.1	2.6
Pennsylvania	34.7	41.9	2.6	2.3
Rhode Island	(NA)	(NA)	(NA)	(NA)
South Carolina	51.2	58.2	2.0	2.1
South Dakota	40.1	35.2	2.4	2.2
Tennessee	55.3	50.7	1.1	3.7
Texas	43.0	38.9	3.9	4.6
Utah	57.7	68.3	4.7	8.4
Vermont	(NA)	(NA)	(NA)	(NA)
Virginia	57.1	46.9	1.2	2.1
Washington	45.9	20.9	2.5	4.0
West Virginia	60.4	62.1	1.3	2.1
Wisconsin	44.8	40.9	0.9	1.4
Wyoming	46.2	40.7	6.6	5.2
United States	42.2	40.9	0.4	0.5

(NA) Not available.
[1] Weighted item response rate based on reported production.
[2] CV for yield ratio.

Quality Metrics for Soybeans Area Harvested for Beans - States and United States: 2021 and 2022

State	Weighted Item Response Rate [1]		Coefficient of Variation [2]	
	2021	2022	2021	2022
	(percent)	(percent)	(percent)	(percent)
Alabama	56.9	65.9	0.5	0.5
Arkansas	46.7	60.9	0.3	0.1
Delaware	38.2	27.5	(Z)	(Z)
Georgia	47.6	54.7	1.4	0.8
Illinois	49.2	49.4	0.3	(Z)
Indiana	47.4	42.6	0.2	(Z)
Iowa	43.0	43.7	(Z)	0.1
Kansas	37.4	35.6	0.3	1.3
Kentucky	49.0	54.7	0.1	0.1
Louisiana	63.5	53.9	0.2	0.7
Maryland	33.3	37.5	0.4	0.8
Michigan	54.1	48.6	0.8	(Z)
Minnesota	42.3	36.8	0.1	0.1
Mississippi	63.8	68.9	0.3	0.1
Missouri	41.9	41.7	0.1	0.1
Nebraska	37.5	39.5	(Z)	0.2
New Jersey	40.1	47.9	0.5	0.5
New York	48.3	43.2	1.0	5.5
North Carolina	63.4	54.4	0.2	0.1
North Dakota	44.3	37.6	0.4	0.1
Ohio	44.6	48.4	(Z)	(Z)
Oklahoma	55.0	57.1	1.6	8.9
Pennsylvania	40.7	47.8	0.4	0.4
South Carolina	56.6	62.4	2.2	0.7
South Dakota	42.1	37.1	0.3	0.2
Tennessee	61.8	53.4	0.2	0.3
Texas	54.2	40.7	3.2	14.5
Virginia	57.4	49.3	0.1	0.3
Wisconsin	50.5	43.9	0.7	0.1
United States	45.9	45.0	0.1	0.1

(Z) Less than half of the unit shown.
[1] Weighted item response rate based on harvested acres.
[2] CV for the ratio of harvested acres to planted acres.

Quality Metrics for Soybeans for Beans Production and Yield - States and United States: 2021 and 2022

State	Weighted Item Response Rate [1]		Coefficient of Variation [2]	
	2021	2022	2021	2022
	(percent)	(percent)	(percent)	(percent)
Alabama	48.5	64.2	2.5	2.3
Arkansas	46.0	58.3	1.3	2.0
Delaware	28.5	23.4	2.1	4.1
Georgia	43.4	47.4	4.5	4.9
Illinois	47.3	45.9	0.9	0.6
Indiana	41.1	40.2	0.6	0.6
Iowa	41.8	40.7	1.0	0.7
Kansas	33.5	33.4	2.3	3.7
Kentucky	47.2	48.2	1.3	1.9
Louisiana	62.4	49.5	1.9	2.0
Maryland	28.8	34.6	1.9	3.3
Michigan	50.7	47.6	1.1	2.6
Minnesota	41.7	35.7	1.6	1.2
Mississippi	62.6	67.9	1.3	1.5
Missouri	38.7	38.6	1.8	2.5
Nebraska	35.6	36.6	1.3	2.1
New Jersey	35.6	41.6	3.8	6.6
New York	46.9	40.8	0.9	6.5
North Carolina	61.6	51.2	1.5	1.8
North Dakota	43.4	35.0	2.8	1.8
Ohio	40.6	45.2	1.4	0.8
Oklahoma	54.2	56.9	4.1	6.7
Pennsylvania	37.7	46.3	1.4	5.0
South Carolina	51.5	57.0	2.7	3.4
South Dakota	40.1	35.8	2.3	1.8
Tennessee	59.5	49.0	1.7	1.5
Texas	35.8	35.3	7.1	18.0
Virginia	56.3	43.9	1.3	2.5
Wisconsin	47.4	41.8	1.5	1.4
United States	43.6	42.8	0.5	0.5

[1] Weighted item response rate based on reported production.
[2] CV for yield ratio.

Quality Metrics for Upland Cotton Area Harvested - States and United States: 2021 and 2022

State	Weighted Item Response Rate [1]		Coefficient of Variation [2]	
	2021	2022	2021	2022
	(percent)	(percent)	(percent)	(percent)
Alabama	49.6	69.7	0.2	(Z)
Arizona	67.1	69.0	0.2	1.6
Arkansas	42.5	54.3	0.7	(Z)
California	58.2	46.5	0.3	(Z)
Florida	45.5	40.8	(Z)	0.3
Georgia	42.7	51.2	(Z)	0.2
Kansas	34.3	27.6	7.3	7.3
Louisiana	50.8	55.4	0.9	(Z)
Mississippi	63.9	64.0	0.4	(Z)
Missouri	31.8	38.9	0.2	(Z)
New Mexico	46.2	46.8	5.1	20.3
North Carolina	52.4	47.4	0.4	(Z)
Oklahoma	43.4	43.3	1.0	11.0
South Carolina	48.8	64.6	0.1	0.1
Tennessee	66.0	55.2	(Z)	0.6
Texas	48.7	48.1	1.7	8.6
Virginia	59.3	53.6	0.1	(Z)
United States	48.3	51.5	0.9	3.1

(Z) Less than half of the unit shown.
 [1] Weighted item response rate based on harvested acres.
 [2] CV for the ratio of harvested acres to planted acres.

Quality Metrics for Upland Cotton Production and Yield - States and United States: 2021 and 2022

State	Weighted Item Response Rate [1]		Coefficient of Variation [2]	
	2021	2022	2021	2022
	(percent)	(percent)	(percent)	(percent)
Alabama	47.2	62.5	2.2	1.7
Arizona	54.0	57.0	5.8	3.6
Arkansas	40.5	51.9	1.8	1.9
California	56.3	44.9	5.0	9.3
Florida	39.5	32.2	6.4	4.4
Georgia	38.5	46.0	1.4	1.3
Kansas	30.0	24.8	4.8	7.5
Louisiana	49.3	53.8	2.7	3.1
Mississippi	61.6	60.9	1.3	1.6
Missouri	30.6	36.7	2.3	1.9
New Mexico	37.0	40.1	17.7	10.5
North Carolina	50.5	42.9	2.3	2.7
Oklahoma	43.3	32.1	4.5	9.6
South Carolina	45.9	57.4	2.9	1.8
Tennessee	61.4	46.5	6.7	1.3
Texas	44.8	40.6	2.3	5.9
Virginia	43.7	33.0	2.4	3.7
United States	44.9	46.3	1.8	1.4

[1] Weighted item response rate based on reported production.
[2] CV for yield ratio.

12

Annual Crop Production Methodology and Quality Measures (February 2023)
USDA, National Agricultural Statistics Service

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

Access to NASS Reports

For your convenience, you may access NASS reports and products the following ways:

➢ All reports are available electronically, at no cost, on the NASS web site: www.nass.usda.gov

➢ Both national and state specific reports are available via a free e-mail subscription. To set-up this free subscription, visit www.nass.usda.gov and click on "National" or "State" in upper right corner above "search" box to create an account and select the reports you would like to receive.

➢ Cornell's Mann Library has launched a new website housing NASS's and other agency's archived reports. The new website, https://usda.library.cornell.edu. All email subscriptions containing reports will be sent from the new website, https://usda.library.cornell.edu. To continue receiving the reports via e-mail, you will have to go to the new website, create a new account and re-subscribe to the reports. If you need instructions to set up an account or subscribe, they are located at: https://usda.library.cornell.edu/help. You should whitelist notifications@usda-esmis.library.cornell.edu in your email client to avoid the emails going into spam/junk folders.

For more information on NASS surveys and reports, call the NASS Agricultural Statistics Hotline at (800) 727-9540, 7:30 a.m. to 4:00 p.m. ET, or e-mail: nass@usda.gov.