



Floriculture Crops Methodology and Quality Measures

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Scope and Purpose: The Commercial Floriculture Survey (CFS) is conducted annually and represents all growers that produced and sold \$10,000 or more of floriculture crops during the previous year. Currently, the survey is conducted in all 50 States.

All floriculture growers are surveyed to report area used for production, hired labor, and value of sales. Detailed crop information is collected from operations with \$100,000 or more in sales. The main types of crops included are cut flowers, annual bedding plants, herbaceous perennials, cut cultivated greens, potted flowering plants, and foliage plants for indoor and patio use. Information is also collected for propagative floriculture materials, including cuttings, liners, plug seedlings, pre-finished plants, and tissue cultures. Crops excluded from this survey are Christmas trees and nursery products such as, but not limited to, deciduous shade trees, fruit and nut trees, evergreen trees, ornamental shrubs and bushes (including roses and azaleas for outdoor landscaping and ornamental purposes), grapevines, and palms for outdoor landscaping. Aquatic and pond plants also are excluded.

Beginning in 2021, data collected from operations with \$10,000 or more in sales are published individually for 28 States for the following items: value of all production, number of producers, area used for production, and peak hired workers. Starting in the same year, 22 minor States were published in an 'Other States' category. For the list of States included in the 'Other States' totals, reference the tables starting on page 4 of this report. For operations with \$100,000 or more in sales, items published include number of producers, quantity sold, price and wholesale value for annual bedding/garden plants, potted herbaceous plants, potted flowering plants, foliage plants potted, cut flowers, cut cultivated greens, and propagative floriculture materials. Retail quantity, price, and value began to be published for the 2021 crop year. The publication contains data for the current survey year and the previous survey year.

Commercial floriculture data are used by the government to measure the economic impact of the industry and by all segments of the industry to plan future production and marketing strategies.

Timeline: Data are collected for the previous year's production beginning in January with a survey mailing. A telephone follow-up is conducted for nonresponse records approximately one month after the mailing. Data collection takes place over a period of approximately eight weeks. Regional field office and Headquarters staff complete analysis, summarization, and review of estimates over a period of approximately four weeks. Estimates are released to the public on the date specified by the Agricultural Statistics Board.

Sampling: The target population for the CFS is all commercial floriculture operations which produce and sell, or have the potential to produce and sell, \$10,000 or more of the floriculture crops in one year in all 50 states. For 28 targeted states, the CFS is a census for operations producing \$10,000 in floriculture sales; therefore, all operations that qualify are included in the survey. For the 22 non-targeted states, only operations with \$100,000 or more in floriculture sales are surveyed. Operations in the 22 non-targeted states between \$10,000 and \$100,000 in floriculture sales are represented by estimates from the 2019 Census of Horticultural Specialties in an effort to reduce respondent burden.

The operations to be surveyed are identified using previously reported sales data stored on the NASS list frame. Both retail and wholesale sales are considered in determining the dollar value of sales for establishing the population. Floriculture crops do not have to be the primary source of income for a grower to qualify. A greenhouse or nursery with production and sales of floriculture products that meets the \$10,000 lower limit qualifies, even though this may represent only a small portion of the operation's total sales. Slightly smaller operations and operations with unknown amounts of floriculture sales are also contacted to determine if they qualify for the survey.

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 questionnaire. The questionnaire content and format are evaluated annually through a specification 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.

Sampled operations receive a cover letter with the questionnaire mailing explaining the survey and providing instructions for completing the survey (via CASI) on the internet. The letter also notifies them that they will be contacted for survey purposes only if they do not return the questionnaire by mail or complete the survey on the web. All modes of data collection, except face-to-face enumeration, are utilized for each survey. Data collection is coordinated for any sampled operations that are in multiple on-going surveys.

Survey Edit: As survey data are collected and captured, data are edited for consistency and reasonableness using automated systems. The edit logic ensures administrative coding 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 summarization.

Analysis Tools: Edited data are processed through an interactive analysis tool which displays data for all reports by item. The tool provides scatter plots, tables, charts, and special tabulations that allow the analyst to compare an individual record to 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 are modified, where necessary, to continually minimize nonresponse error.

Estimators: The CFS is a complete enumeration of all known floriculture operations with \$10,000 or more in sales, and new operations are added to the sample when discovered. A coverage adjustment is made to account for list incompleteness. Response to the CFS is voluntary. Producers may refuse to participate in the survey, may not be located during the data collection period, or may submit incomplete reports. All nonresponse (item and unit) is

manually imputed by RFO statisticians. The weights for current items are not adjusted for nonresponse. The measurement of error due to sampling in the current survey period is irrelevant for a fully enumerated census. Moreover, standard errors and coefficients of variation (CVs) are zero for all current data items collected.

Estimation: When all samples are accounted for, all responses are fully edited, and the analysis material is reviewed, Headquarters executes a preliminary summary and a final summary to evaluate and analyze the data. The summary results provide estimates and information used to evaluate the quality of the survey estimates such as response rates and number of usable positive reports.

Regional field offices and Headquarters are responsible for performing a detailed review of the survey results. Any irregularities revealed by the preliminary summary must be investigated and, if necessary, resolved.

Estimates are open to revision the following year if new information becomes available. If an operation responds that was inaccessible for the previous year, the previous year data is reviewed for accuracy and revised if necessary. The previous year estimates are recreated with the updated information and released at the same time as the current year estimates.

Quality Metrics for Floriculture Crops

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 this survey because it is a census of the target population. Nonsampling error is evaluated by 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, did not meet the \$10,000 threshold in sales, 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.

Commercial Floriculture Survey Sample Sizes and Response Rates: The Commercial Floriculture Survey is a census of all known floriculture operations that produced and sold \$10,000 or more of product during the previous year. However, detailed crop information is collected from only operations with \$100,000 or more in sales. To assist in evaluating the performance of the estimates in the *Floriculture Crops* report, the sample sizes and response rates are displayed for 2022 and 2023 in each of the published States for operations with \$10,000 or more in sales and for operations with \$100,000 or more in sales.

**Commercial Floriculture Survey Sample Size and Response Rate - States and United States:
2022 and 2023**

[Operations with \$10,000+ sales]

State	Sample size		Response rate	
	2022 (number)	2023 (number)	2022 (percent)	2023 (percent)
Alabama	67	67	58.2	77.6
Alaska	56	70	57.1	64.3
California	435	529	52.6	52.9
Colorado	84	99	42.9	56.6
Connecticut	139	151	48.9	48.3
Florida	461	510	58.6	55.7
Georgia	81	82	61.7	64.6
Hawaii	194	203	59.3	56.2
Illinois	189	214	48.7	46.7
Indiana	165	179	90.9	74.3
Iowa	142	151	57.0	58.9
Maryland	122	139	58.2	65.5
Massachusetts	199	211	59.8	66.8
Michigan	454	483	82.4	78.7
Minnesota	188	201	48.4	51.2
New Jersey	230	241	53.9	50.2
New York	460	553	58.3	53.7
North Carolina	219	251	63.9	64.5
Ohio	365	386	68.2	66.3
Oregon	208	222	62.0	57.7
Pennsylvania	568	600	62.1	62.8
South Carolina	57	74	71.9	62.2
Tennessee	101	132	53.5	58.3
Texas	181	201	62.4	52.7
Utah	34	48	61.8	60.4
Virginia	150	186	48.7	38.7
Washington	204	239	45.1	48.5
Wisconsin	324	338	59.6	62.4
Other States ¹	363	363	52.1	52.9
United States	6,440	7,123	59.9	58.7

¹ Other States includes Arizona, Arkansas, Delaware, Idaho, Kansas, Kentucky, Louisiana, Maine, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Dakota, Oklahoma, Rhode Island, South Dakota, Vermont, West Virginia, and Wyoming for operations with greater than \$100,000 in sales. Smaller operations were not surveyed in these States.

Commercial Floriculture Survey Sample Size and Response Rate - States and United States: 2022 and 2023

[Operations with \$100,000+ sales]

State	Sample size		Response rate	
	2022 (number)	2023 (number)	2022 (percent)	2023 (percent)
Alabama	39	32	66.7	81.3
Alaska	19	21	26.3	28.6
California	253	273	51.0	48.0
Colorado	56	55	35.7	52.7
Connecticut	67	70	41.8	38.6
Florida	295	309	59.3	54.0
Georgia	38	34	57.9	76.5
Hawaii	70	60	45.7	50.0
Illinois	89	97	34.8	42.3
Indiana	61	63	77.0	65.1
Iowa	42	43	59.5	58.1
Maryland	53	58	64.2	58.6
Massachusetts	75	86	52.0	68.6
Michigan	272	279	72.4	71.3
Minnesota	93	96	47.3	52.1
New Jersey	119	116	48.7	43.1
New York	181	188	51.4	51.6
North Carolina	86	88	50.0	56.8
Ohio	169	175	65.1	55.4
Oregon	92	91	59.8	52.7
Pennsylvania	190	195	56.8	57.4
South Carolina	16	25	75.0	72.0
Tennessee	32	34	59.4	58.8
Texas	115	104	58.3	60.6
Utah	27	30	59.3	46.7
Virginia	69	73	39.1	41.1
Washington	69	62	55.1	62.9
Wisconsin	137	135	61.3	63.0
Other States ¹	363	363	52.1	52.9
United States	3,187	3,255	55.6	55.5

¹ Other States includes Arizona, Arkansas, Delaware, Idaho, Kansas, Kentucky, Louisiana, Maine, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Dakota, Oklahoma, Rhode Island, South Dakota, Vermont, West Virginia, and Wyoming.

Commercial Floriculture Survey Weighted Item Response Rates: To assist in evaluating the performance of the estimates in the *Floriculture Crops* report, the weighted item response rate is displayed by program State and nationally for each plant category and in total for 2022 and 2023.

Quality Metrics for Value of All Sales by Plant Category - States and United States: 2022 and 2023

[Operations with \$100,000+ sales]

State	Weighted item response rate					
	Annual bedding/garden		Herbaceous perennial		Total bedding/garden	
	2022	2023	2022	2023	2022	2023
	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)
Alabama	24.7	36.0	95.3	97.1	37.9	44.6
Alaska	10.9	(D)	0.3	(D)	10.0	(D)
California	21.0	77.5	38.7	56.4	25.4	72.9
Colorado	18.8	49.3	25.2	55.7	20.6	51.0
Connecticut	40.8	29.4	42.6	33.9	41.5	31.2
Florida	71.7	3.6	79.2	40.8	73.8	13.6
Georgia	91.8	80.6	41.7	92.9	81.6	83.7
Hawaii	(D)	(D)	(D)	(D)	65.0	(D)
Illinois	32.9	41.9	38.0	44.5	36.0	43.3
Indiana	44.7	41.0	58.9	32.8	49.2	38.7
Iowa	80.7	48.9	76.8	35.7	79.6	45.5
Maryland	31.6	36.2	39.5	38.9	34.4	37.2
Massachusetts	33.4	57.0	17.3	34.7	27.8	47.7
Michigan	71.8	67.3	54.4	56.1	67.8	65.1
Minnesota	31.3	76.3	33.1	69.7	31.6	74.9
New Jersey	19.2	22.6	37.9	26.7	26.5	24.2
New York	60.7	46.7	76.5	49.5	64.9	47.5
North Carolina	17.0	68.9	17.1	68.4	17.1	68.8
Ohio	75.2	42.1	92.9	57.9	83.9	49.6
Oregon	57.4	58.7	30.5	25.0	48.3	46.9
Pennsylvania	62.9	59.5	71.0	64.2	65.4	60.9
South Carolina	(D)	80.3	(D)	2.8	11.6	7.8
Tennessee	29.4	14.3	93.9	32.1	41.7	17.5
Texas	37.3	26.4	40.5	44.0	37.9	29.5
Utah	70.1	22.7	53.3	5.6	64.9	17.2
Virginia	40.3	31.9	30.8	23.3	37.7	29.7
Washington	51.4	60.2	81.9	73.2	65.8	66.3
Wisconsin	48.2	59.5	46.4	73.5	47.8	63.3
Other States ¹	51.6	43.6	29.9	54.7	51.5	45.9
United States	49.3	48.3	50.4	45.6	49.6	47.5

See footnote(s) at end of table.

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**Quality Metrics for Value of All Sales by Plant Category - States and United States:
2022 and 2023 (continued)**

[Operations with \$100,000+ sales]

State	Weighted item response rate					
	Potted flowering plants		Foliage plants for indoor or patio use		Cut flowers	
	2022	2023	2022	2023	2022	2023
	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)
Alabama	87.1	87.1	92.5	(D)	-	-
Alaska	1.6	0.1	(D)	21.1	(D)	77.5
California	37.0	50.7	28.6	73.7	30.5	29.3
Colorado	19.9	44.4	17.5	(D)	11.6	20.5
Connecticut	52.5	34.6	82.9	(D)	(D)	86.1
Florida	57.6	33.1	34.4	29.8	59.5	92.4
Georgia	85.6	64.7	91.1	80.0	(D)	(D)
Hawaii	66.3	62.7	60.3	67.9	57.7	83.5
Illinois	25.0	45.5	54.6	21.8	0.5	17.9
Indiana	56.4	34.5	25.6	43.8	84.9	96.3
Iowa	85.8	25.9	(D)	(D)	-	-
Maryland	20.2	22.2	97.2	(D)	83.9	78.2
Massachusetts	43.8	48.4	67.6	74.4	90.8	47.6
Michigan	54.3	55.9	(D)	41.5	(D)	98.3
Minnesota	32.0	65.7	78.4	(D)	(D)	(D)
New Jersey	63.0	58.0	(D)	(D)	(D)	41.1
New York	90.3	20.8	(D)	(D)	81.6	43.1
North Carolina	21.2	74.5	(D)	78.2	33.8	87.5
Ohio	90.0	39.1	79.0	51.0	(D)	98.9
Oregon	61.5	48.7	82.3	79.2	91.3	61.6
Pennsylvania	42.2	38.0	54.0	60.6	33.9	33.6
South Carolina	74.0	79.7	(D)	(D)	(D)	(D)
Tennessee	88.4	28.4	90.5	77.9	(D)	(D)
Texas	64.1	38.1	20.1	(D)	(D)	(D)
Utah	44.4	1.7	(D)	96.3	(D)	(D)
Virginia	29.3	27.9	(D)	57.3	12.6	24.7
Washington	61.1	54.9	33.5	(D)	18.5	10.7
Wisconsin	65.0	60.8	82.3	40.7	(D)	(D)
Other States ¹	48.1	28.4	67.1	32.7	63.0	93.0
United States	53.2	43.2	38.2	39.7	40.0	40.2

See footnote(s) at end of table.

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**Quality Metrics for Value of All Sales by Plant Category - States and United States:
2022 and 2023 (continued)**

[Operations with \$100,000+ sales]

State	Weighted item response rate					
	Cut cultivated greens		Propagative floriculture material		Total value of all plant categories	
	2022	2023	2022	2023	2022	2023
	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)
Alabama	(D)	-	(D)	(D)	45.1	49.4
Alaska	-	-	-	-	12.6	34.8
California	81.9	50.4	68.7	41.7	33.4	55.8
Colorado	-	(D)	1.0	30.7	15.4	47.4
Connecticut	-	-	(D)	(D)	43.1	32.9
Florida	41.3	20.1	58.7	32.7	49.7	27.7
Georgia	(D)	-	100.0	(D)	84.5	80.7
Hawaii	67.4	85.5	17.4	52.1	60.9	62.7
Illinois	(D)	(D)	(D)	(D)	34.5	45.7
Indiana	-	-	99.4	96.7	51.0	40.6
Iowa	-	-	(D)	(D)	83.1	53.1
Maryland	(D)	(D)	(D)	69.3	34.9	37.8
Massachusetts	(D)	(D)	(D)	(D)	30.7	51.5
Michigan	-	100.0	59.9	85.3	66.2	66.9
Minnesota	(D)	-	3.7	21.6	27.1	73.4
New Jersey	-	(D)	5.0	6.8	37.1	32.6
New York	(D)	(D)	18.1	11.1	67.7	33.9
North Carolina	(D)	(D)	94.7	(D)	21.6	71.6
Ohio	(D)	100.0	30.7	16.5	80.6	47.6
Oregon	76.4	64.8	11.9	81.7	54.4	52.9
Pennsylvania	100.0	34.0	93.6	99.7	66.4	66.7
South Carolina	-	-	-	-	12.9	10.2
Tennessee	-	(D)	(D)	(D)	49.1	22.0
Texas	-	-	(D)	15.1	41.7	26.6
Utah	-	-	(D)	(D)	61.7	15.3
Virginia	(D)	(D)	23.6	(D)	35.3	28.8
Washington	(D)	(D)	(D)	71.4	57.7	57.5
Wisconsin	-	(D)	(D)	(D)	53.1	67.8
Other States ¹	47.7	92.3	83.1	71.8	52.9	42.7
United States	49.5	33.1	54.3	56.3	48.6	45.8

- Represents zero.

(D) Withheld to avoid disclosing data for individual operations.

¹ Other States includes Arizona, Arkansas, Delaware, Idaho, Kansas, Kentucky, Louisiana, Maine, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Dakota, Oklahoma, Rhode Island, South Dakota, Vermont, West Virginia, Wyoming, and any data withheld above.

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 & Imputation Methodology Branch	(202) 690-8141	SM.NASS.MD.SEIMB.CSD.SB@usda.gov
Analysis and Estimators	Summary, Estimation & Disclosure Methodology Branch	(202) 690-8141	SM.NASS.SD.SMB@usda.gov
Dissemination	Data Dissemination Office	(202) 720-3869	HQSDOD@usda.gov
Media Contact & Webmaster	Public Affairs Office	(202) 720-2639	HQOAPAO@usda.gov

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