

# 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 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, twenty-two 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. 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.

The survey population is identified from the NASS list frame population. The CFS is a census for all States published individually; therefore, all operations that qualify are included in the survey. To reduce respondent burden, only operations with \$100,000 in sales are surveyed in the 22 'Other States'. Operations between \$10,000 and \$100,000 in floriculture sales are represented by estimates from the 2019 Census of Horticulture Specialties.

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 growers with an operation that produced and sold \$10,000 or more of product during the previous year in all 50 States. 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 2021 and 2022 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: 2021 and 2022

[Operations with \$10,000+ sales]

Ctata	Sample	size	Response rate		
State	2021	2022	2021	2022	
	(number)	(number)	(percent)	(percent)	
Alabama	70	67	65.7	58.2	
Alaska	58	56	62.1	57.1	
California	495	435	52.5	52.6	
Colorado	93	84	55.9	42.9	
Connecticut	143	139	39.2	48.9	
Florida	511	461	52.8	58.6	
Georgia	88	81	60.2	61.7	
Hawaii	210	194	58.6	59.3	
Illinois	206	189	48.1	48.7	
Indiana	180	165	75.6	90.9	
lowa	140	142	55.0	57.0	
Maryland	123	122	64.2	58.2	
Massachusetts	217	199	53.5	59.8	
Michigan	476	454	70.2	82.4	
Minnesota	190	188	53.2	48.4	
New Jersey	249	230	49.4	53.9	
New York	466	460	56.9	58.3	
North Carolina	227	219	62.1	63.9	
Ohio	379	365	62.3	68.2	
Oregon	219	208	63.0	62.0	
Pennsylvania	606	568	55.4	62.1	
South Carolina	67	57	65.7	71.9	
Tennessee	115	101	52.2	53.5	
Texas	196	181	48.5	62.4	
Utah	37	34	81.1	61.8	
Virginia	151	150	51.0	48.7	
Washington	219	204	47.9	45.1	
Wisconsin	342	324	57.6	59.6	
Other States <sup>1</sup>	365	363	46.8	52.1	
United States	6,838	6,440	56.4	59.9	

<sup>&</sup>lt;sup>1</sup> 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: 2021 and 2022

[Operations with \$100,000+ sales]

Ctata	Sampl	e size	Response rate		
State -	2021	2022	2021	2022	
	(number)	(number)	(percent)	(percent)	
Alabama	39	39	66.7	66.7	
Alaska	20	19	40.0	26.3	
California	288	253	51.4	51.0	
Colorado	63	56	60.3	35.7	
Connecticut	67	67	34.3	41.8	
Florida	328	295	56.1	59.3	
Georgia	43	38	65.1	57.9	
Hawaii	72	70	58.3	45.7	
Illinois	87	89	43.7	34.8	
Indiana	58	61	69.0	77.0	
lowa	44	42	54.5	59.5	
Maryland	49	53	63.3	64.2	
Massachusetts	87	75	62.1	52.0	
Michigan	275	272	68.7	72.4	
Minnesota	97	93	51.5	47.3	
New Jersey	133	119	42.9	48.7	
New York	195	181	53.8	51.4	
North Carolina	89	86	58.4	50.0	
Ohio	159	169	49.1	65.1	
Oregon	92	92	62.0	59.8	
Pennsylvania	186	190	50.0	56.8	
South Carolina	20	16	65.0	75.0	
Tennessee	31	32	58.1	59.4	
Texas	120	115	47.5	58.3	
Utah	29	27	75.9	59.3	
Virginia	71	69	43.7	39.1	
Washington	69	69	53.6	55.1	
Wisconsin	137	137	59.1	61.3	
Other States <sup>1</sup>	365	363	46.8	52.1	
United States	3,313	3,187	54.2	55.6	

<sup>&</sup>lt;sup>1</sup> 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 2021 and 2022.

Quality Metrics for Value of All Sales by Plant Category - States and United States: 2021 and 2022

[Operations with \$100,000+ sales]

	Weighted item response rate						
State	Annual bedding/garden		Herbaceous perennial		Total bedding/garden		
	2021	2022	2021	2022	2021	2022	
	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)	
Alabama	55.1	24.7	91.5	95.3	62.3	37.9	
Alaska	38.3	10.9	43.5	0.3	38.8	10.0	
California	75.1	21.0	58.0	38.7	70.2	25.4	
Colorado	67.1	18.8	77.2	25.2	70.0	20.6	
Connecticut	29.3	40.8	70.6	42.6	44.7	41.5	
Florida	27.5	71.7	70.9	79.2	41.2	73.8	
Georgia	74.7	91.8	84.0	41.7	76.6	81.6	
Hawaii	(D)	(D)	(D)	(D)	47.5	65.0	
Illinois	49.2	32.9	79.7	38.Ó	66.4	36.0	
Indiana	42.6	44.7	52.0	58.9	45.4	49.2	
lowa	74.5	80.7	73.3	76.8	74.2	79.6	
Maryland	40.5	31.6	44.3	39.5	41.7	34.4	
Massachusetts	61.1	33.4	34.0	17.3	51.6	27.8	
Michigan	77.9	71.8	70.7	54.4	76.3	67.8	
Minnesota	66.0	31.3	59.9	33.1	64.9	31.6	
New Jersey	48.5	19.2	54.8	37.9	50.8	26.5	
New York	49.9	60.7	53.8	76.5	50.9	64.9	
North Carolina	22.5	17.0	24.6	17.1	23.1	17.1	
Ohio	40.9	75.2	76.3	92.9	58.4	83.9	
Oregon	58.2	57.4	36.4	30.5	49.5	48.3	
Pennsylvania	41.5	62.9	35.5	71.0	39.6	65.4	
South Carolina	(D)	(D)	(D)	(D)	17.6	11.6	
Tennessee	74.7	29.4	88.3	93.9	76.1	41.7	
Texas	75.2	37.3	74.9	40.5	75.2	37.9	
Utah	93.3	70.1	86.3	53.3	90.8	64.9	
Virginia	42.7	40.3	25.0	30.8	38.3	37.7	
Washington	38.2	51.4	9.0	81.9	29.7	65.8	
Wisconsin	42.1	48.2	65.1	46.4	47.1	47.8	
Other States <sup>1</sup>	47.3	51.6	33.5	29.9	42.0	51.5	
United States	56.0	49.3	57.6	50.4	56.5	49.6	

See footnote(s) at end of table. --continued

# Quality Metrics for Value of All Sales by Plant Category - States and United States: 2021 and 2022 (continued)

[Operations with \$100,000+ sales]

		Weighted item response rate					
State	Potted flowering plants		Foliage plants for indoor or patio use		Cut flowers		
	2021	2022	2021	2022	2021	2022	
	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)	
Alabama	56.6	87.1	90.5	92.5	-	-	
Alaska	16.0	1.6	(D)	(D)	(D)	(D)	
California	46.9	37.0	76.5	28.6	73.2	30.5	
Colorado	40.3	19.9	76.5	17.5	12.2	11.6	
Connecticut	47.2	52.5	89.0	82.9	(D)	(D)	
Florida	20.3	57.6	31.9	34.4	57.3	59.5	
Georgia	61.8	85.6	96.2	91.1	(D)	(D)	
Hawaii	71.7	66.3	75.5	60.3	57.2	57.7	
Illinois	49.8	25.0	36.2	54.6	4.5	0.5	
Indiana	45.6	56.4	26.3	25.6	90.9	84.9	
lowa	84.5	85.8	94.1	(D)	(D)	-	
Maryland	21.5	20.2	97.6	97.2	53.9	83.9	
Massachusetts	63.6	43.8	79.0	67.6	91.7	90.8	
Michigan	73.3	54.3	90.6	(D)	(D)	(D)	
Minnesota	58.6	32.0	(D)	78.4	(D)	(D)	
New Jersey	64.8	63.0	93.8	(D)	29.0	(D)	
New York	32.6	90.3	(D)	(D)	79.4	81.6	
North Carolina	36.1	21.2	74.7	(D)	42.0	33.8	
Ohio	14.6	90.0	40.2	79.0	(D)	(D)	
Oregon	48.0	61.5	94.3	82.3	86.2	91.3	
Pennsylvania	34.6	42.2	24.6	54.0	33.8	33.9	
South Carolina	71.0	74.0	(D)	(D)	(D)	(D)	
Tennessee	66.4	88.4	90.1	90.5	-	(D)	
Texas	52.0	64.1	99.5	20.1	100.0	(D)	
Utah	54.0	44.4	(D)	(D)	(D)	(D)	
Virginia	30.9	29.3	54.9	(D)	58.2	12.6	
Washington	12.3	61.1	(D)	33.5	79.9	18.5	
Wisconsin	70.1	65.0	72.0	82.3	(D)	(D)	
Other States <sup>1</sup>	31.1	48.1	68.8	67.1	95.1	63.0	
United States	39.9	53.2	50.3	38.2	68.7	40.0	

See footnote(s) at end of table. --continued

# Quality Metrics for Value of All Sales by Plant Category - States and United States: 2021 and 2022 (continued)

[Operations with \$100,000+ sales]

			esponse rate	rate		
State	Cut cultivated greens		Propagative floriculture material		Total wholesale value of all plant categories	
	2021	2022	2021	2022	2021	2022
	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)
Alabama	(D)	(D)	(D)	(D)	64.3	45.1
Alaska	-	-	-	-	38.7	12.6
California	53.8	81.9	52.8	68.7	64.3	33.4
Colorado	-	-	16.0	1.0	54.0	15.4
Connecticut	-	-	(D)	(D)	45.2	43.1
Florida	47.3	41.3	70.9	58.7	35.6	49.7
Georgia	(D)	(D)	(D)	100.0	76.0	84.5
Hawaii	63.8	67.4	55.3	17.4	68.8	60.9
Illinois	(D)	(D)	(D)	(D)	64.2	34.5
Indiana	-	-	100.0	99.4	46.1	51.0
lowa	-	-	(D)	(D)	78.6	83.1
Maryland	2.9	(D)	10Ò.Ó	(D)	41.7	34.9
Massachusetts	(D)	(D)	(D)	(D)	51.8	30.7
Michigan	(D)	-	6Ò.9	59.9	74.0	66.2
Minnesota	` <del>-</del>	(D)	1.4	3.7	63.5	27.1
New Jersey	-	` -	100.0	5.0	60.5	37.1
New York	(D)	(D)	15.9	18.1	44.7	67.7
North Carolina	10Ò.Ó	(D)	58.6	94.7	27.9	21.6
Ohio	-	(D)	(D)	30.7	44.0	80.6
Oregon	83.2	7 <b>6</b> .4	8.3	11.9	51.7	54.4
Pennsylvania	100.0	100.0	72.8	93.6	45.0	66.4
South Carolina	-	-	(D)	-	18.6	12.9
Tennessee	_	_	-	(D)	75.7	49.1
Texas	_	_	72.0	(D)	75.4	41.7
Utah	_	_	(D)	(D)	83.1	61.7
Virginia	(D)	(D)	(D)	23.6	36.3	35.3
Washington	(D)	(D)	28.9	(D)	40.5	57.7
Wisconsin	(D)	-	(D)	(D)	52.5	53.1
Other States <sup>1</sup>	35.2	47.7	64.6	83.1	50.8	52.9
United States	49.0	49.5	61.2	54.3	53.9	48.6

<sup>-</sup> Represents zero.

<sup>(</sup>D) Withheld to avoid disclosing data for individual operations.

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
QuestionnairesSampling and Editing	Survey Administration Branch Data Collection Branch Sampling, Editing & Imputation Methodology Branch Summary, Estimation & Disclosure Methodology Branch Data Dissemination Office	(202) 690-4847 (202) 720-6201 (202) 690-8141 (202) 690-8141 (202) 720-3869	HQ_SD_CB@usda.gov HQ_CSD_SAB@usda.gov HQ_CSD_DCB@usda.gov SM.NASS.MD.SEIMB.CSD.SB@usda.gov SM.NASS.SD.SMB@usda.gov HQSDOD@usda.gov HQOAPAO@usda.gov

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- Cornell's Mann Library has launched a new website housing NASS's and other agency's archived reports. The new website, <a href="https://usda.library.cornell.edu">https://usda.library.cornell.edu</a>. All email subscriptions containing reports will be sent from the new website, <a href="https://usda.library.cornell.edu">https://usda.library.cornell.edu</a>. 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: <a href="https://usda.library.cornell.edu/help.">https://usda.library.cornell.edu/help.</a>. You should whitelist <a href="motifications@usda-esmis.library.cornell.edu">notifications@usda-esmis.library.cornell.edu</a> 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.

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