



# Floriculture Crops Methodology and Quality Measures

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## Commercial Floriculture Survey Methodology

**Scope and Purpose:** The Commercial Floriculture Survey (CFS) is conducted annually and is a census of all floriculture growers that produced and sold \$10,000 or more of product during the previous year. Currently there are 15 States surveyed: California, Florida, Hawaii, Illinois, Maryland, Michigan, New Jersey, New York, North Carolina, Ohio, Oregon, Pennsylvania, South Carolina, Texas, and Washington. For the 2014 crop year, the CFS was included in the Census of Horticulture Specialties.

All floriculture growers are surveyed to report 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. 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.

Data collected for operations with \$10,000 or more in sales are published for 15 program States as follows: value of all production, number of producers, area used for production, and peak hired workers. The data are published for the current survey year and the previous survey year. Production data for operations with \$100,000 or more in sales are reported by State as relevant. 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. The area and labor statistics will not be comparable between the two published years as they will include nursery production area and labor for 2014 due to combined data collection efforts with the 2014 Census of Horticultural Specialties.

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.

**Survey Timeline:** Data are collected for the previous year's production beginning in January with a survey mailing. A telephone follow-up is conducted for non-response records approximately one month after the mailing. Data collection takes place over a period of approximately eight weeks. Regional field office staff complete analysis, summarization, and submission of estimates over a period of approximately three 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.

The survey population is identified from the NASS list frame population. The CFS is a census; therefore, all operations that qualified are included in the survey.



**Data Collection:** Sampled floriculture producers receive a pre-survey letter explaining the survey along with a questionnaire to complete and return by mail. If a response is not received by mail, respondents are contacted by phone to obtain the survey data. Personal interviews are limited to large operations or those with special handling arrangements.

**Survey Edit:** As survey data are collected and captured, they are edited for consistency and reasonableness using automated systems. Reported data are edited as a batch of data when first captured. 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 will determine the status of each record to be either “dirty” or “clean” (i.e. failing or passing the edit requirements for consistency and reasonableness).

Records that fail edit requirements must be updated. Only records that pass edit requirements are eligible for final summary.

**Analysis Tools:** Edited floriculture survey 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. This tool allows atypical responses and unusual data relationships, as well as large changes in the operation, to become evident. Following careful review, data found to be in error are corrected, while correct data are retained.

**Nonsampling Errors:** Nonsampling errors are present in any survey process. These include reporting, recording, and editing errors. Steps are taken to minimize these errors, such as comprehensive interviewer training, validation and verification of processing systems, application of detailed computer edits, and evaluation of the data via the analysis tools.

**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, however since the CFS was included in the Census of Horticulture Specialties the response was mandatory for the 2014 crop year. Producers may refuse to participate in the survey, may not be located during the data collection period, or may submit incomplete reports. The non-response data items and sampling units are imputed by Regional field office statisticians. The weights for current items are not adjusted for non-response.

Since manual imputation is conducted for all non-response units and items, point estimates are an accounting of all responses and manual imputations. 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 fully edited, and the analysis material reviewed, each Regional field office executes a preliminary summary and a final summary to evaluate and analyze the data. When all Regional field offices have executed summaries, Headquarters executes the National summary. The summary results provide multiple point 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 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. In cases where recommendations deviate from survey results, Regional field offices must provide justification.

The review of National estimates is conducted by the Headquarters commodity statistician and a statistician who is selected by the Agricultural Statistics Board (ASB). The selected statistician assists the Headquarters statistician in review of all state level and commodity use level recommendations and establishes official estimates.

## Quality Metrics for Floriculture

**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 our published data series. The following metrics tables describe the performance data for the survey contributing to the publication. The accuracy of data products may be evaluated through sampling and non-sampling error. The measurement of error due to sampling in the current period is irrelevant for a fully enumerated data series. Non-sampling error is evaluated by response rates and the percent of the estimate from reported data.

**Sample size** is the number of observations selected from the population to represent a characteristic of the population.

**Response rates** are the proportion of the sample that responded to the survey.

**Percent of estimate from reported data** is the estimated value of a characteristic from respondent reports, divided by the estimated value of a characteristic from all reports expressed as a percent.

**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 the 15 program 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 2014 and 2015 in each of the 15 program States for operations with \$10,000 or more in sales and for operations with \$100,000 or more in sales.

For the 2014 crop year, the Census of Horticulture Specialties was conducted, which included all operations that were sampled for the Commercial Floriculture Survey, as well as Nursery operations. Responses from only the floriculture operations were included in the quality metrics for year 2014.

### Commercial Floriculture Survey Sample Size and Response Rate - 15 Program States: 2014 and 2015

[Operations with \$10,000+ sales]

State	Sample size		Response rate	
	2014 (number)	2015 (number)	2014 (percent)	2015 (percent)
California .....	622	634	88.9	74.4
Florida .....	631	626	78.4	67.7
Hawaii .....	297	287	83.8	71.1
Illinois .....	237	255	82.7	60.0
Maryland .....	134	142	82.1	59.9
Michigan .....	474	530	79.7	55.8
New Jersey .....	266	244	78.9	57.8
New York .....	494	543	80.0	70.5
North Carolina .....	224	240	88.4	74.6
Ohio .....	368	445	81.5	56.9
Oregon .....	255	270	69.8	62.6
Pennsylvania .....	577	665	77.3	69.3
South Carolina .....	61	60	85.2	88.3
Texas .....	230	213	90.0	74.6
Washington .....	227	236	52.0	50.4
15 State Total .....	5,097	5,390	80.1	65.9

## Commercial Floriculture Survey Sample Size and Response Rate - 15 Program States: 2014 and 2015

[Operations with \$100,000+ sales]

State	Sample size		Response rate	
	2014 (number)	2015 (number)	2014 (percent)	2015 (percent)
California .....	387	366	84.8	76.5
Florida .....	417	413	74.1	62.5
Hawaii .....	86	82	77.9	64.6
Illinois .....	112	106	75.9	55.7
Maryland .....	67	54	76.1	53.7
Michigan .....	289	280	71.6	54.3
New Jersey .....	143	131	72.0	53.4
New York .....	209	200	72.7	66.5
North Carolina .....	94	98	77.7	65.3
Ohio .....	182	167	69.8	52.7
Oregon .....	99	106	64.6	67.9
Pennsylvania .....	186	183	67.2	58.5
South Carolina .....	23	21	82.6	81.0
Texas .....	153	126	86.9	69.8
Washington .....	73	77	60.3	50.6
15 State Total .....	2,520	2,410	74.9	62.6

**Floriculture Survey Percent of Estimate from Reported Data:** To assist in evaluating the performance of the estimates in the *Floriculture Crops* report, the percent of the estimate of the wholesale value of sales from reported data is displayed by program State and nationally for each plant category and in total for 2014 and 2015.

**Quality Metrics for Wholesale Value of Sales by Plant Category - 15 Program States: 2014 and 2015**

[Operations with \$100,000+ sales]

State	Percent of estimate from reported data					
	Annual bedding/garden		Herbaceous perennial		Total bedding/garden	
	2014	2015	2014	2015	2014	2015
	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)
California .....	87.3	71.4	85.7	61.6	86.9	68.7
Florida .....	52.4	45.9	40.4	58.4	49.0	49.3
Hawaii .....	42.2	23.9	98.8	60.9	64.4	39.4
Illinois .....	54.5	25.3	72.0	24.8	62.3	25.1
Maryland .....	63.6	83.8	69.6	81.2	65.3	82.9
Michigan .....	69.1	65.2	45.8	76.9	63.6	67.9
New Jersey .....	78.9	40.0	79.4	22.8	79.1	32.7
New York .....	52.6	48.3	55.4	51.6	53.3	49.1
North Carolina .....	87.1	90.5	69.6	75.2	83.4	86.9
Ohio .....	67.2	60.0	75.3	37.8	70.3	51.4
Oregon .....	65.5	62.6	29.6	74.0	52.1	66.8
Pennsylvania .....	75.3	60.4	77.3	78.3	75.7	64.9
South Carolina .....	66.4	69.5	64.3	64.7	64.6	65.4
Texas .....	80.0	66.1	76.3	59.5	79.2	64.8
Washington .....	23.3	30.2	39.6	66.4	30.0	46.4
15 State Total .....	70.4	63.0	64.0	58.9	68.4	61.8
State	Potted flowering plants		Foliage plants for indoor or patio use		Cut flowers	
	2014	2015	2014	2015	2014	2015
California .....	72.5	90.8	92.0	55.1	88.3	84.1
Florida .....	53.5	64.0	32.9	73.7	67.4	19.1
Hawaii .....	78.9	67.5	95.3	81.6	74.9	60.2
Illinois .....	47.1	12.4	26.2	77.2	77.9	69.8
Maryland .....	86.3	59.5	(D)	(D)	(D)	0
Michigan .....	82.7	67.6	64.2	92.0	98.1	3.5
New Jersey .....	92.3	36.4	(D)	(D)	98.8	82.0
New York .....	43.2	38.1	(D)	(D)	80.0	88.4
North Carolina .....	88.7	93.6	(D)	(D)	69.5	56.4
Ohio .....	95.8	94.2	91.1	73.8	(D)	(D)
Oregon .....	83.0	53.6	(D)	99.4	47.9	81.6
Pennsylvania .....	46.7	84.7	(D)	(D)	20.0	(D)
South Carolina .....	18.2	21.8	(D)	(D)	(D)	(D)
Texas .....	57.7	46.9	85.3	(D)	(D)	(D)
Washington .....	22.1	52.1	86.5	(D)	96.6	8.5
15 State Total .....	67.8	73.1	48.2	70.5	85.3	77.7

See footnote(s) at end of table.

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**Quality Metrics for Wholesale Value of All Sales by Plant Category - 15 Program States:  
2014 and 2015 (continued)**

[Operations with \$100,000+ sales]

State	Percent of estimate from reported data					
	Cut cultivated greens		Propagative floriculture material		Total wholesale value of all plant categories	
	2014	2015	2014	2015	2014	2015
	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)
California .....	(D)	74.7	(D)	76.8	83.4	78.0
Florida .....	76.7	78.0	64.9	62.5	45.2	67.8
Hawaii .....	98.4	90.9	57.5	47.3	79.9	66.3
Illinois .....	(D)	-	(D)	6.5	58.6	22.7
Maryland .....	(D)	-	23.6	(D)	62.1	80.8
Michigan .....	(D)	(D)	(D)	(D)	71.7	72.8
New Jersey .....	(D)	(D)	(D)	2.0	82.0	34.1
New York .....	(D)	(D)	(D)	40.5	49.8	46.2
North Carolina .....	-	-	(D)	(D)	84.6	87.9
Ohio .....	-	-	(D)	(D)	78.9	66.0
Oregon .....	(D)	84.1	75.2	50.3	56.5	65.6
Pennsylvania .....	(D)	(D)	(D)	(D)	65.4	73.3
South Carolina .....	-	-	-	(D)	58.1	59.8
Texas .....	(D)	(D)	88.9	(D)	77.1	61.7
Washington .....	81.4	(D)	56.5	62.0	42.3	43.2
15 State Total .....	79.3	77.7	73.8	70.2	67.4	67.9

- Represents zero.

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

## Information Contacts

Process	Unit	Telephone	Email
Estimation .....	Crops Branch	(202) 720-2127	HQ_SD_CB@nass.usda.gov
Data Collection .....	Survey Administration Branch	(202) 720-3895	HQ_CSD_SAB@nass.usda.gov
Questionnaires .....	Data Collection Branch	(202) 720-6201	HQ_CSD_DCB@nass.usda.gov
Sampling and Editing .....	Sampling Editing and Imputation Methodology Branch	(202) 720-8671	HQ_CSD_SB@nass.usda.gov
Summary and Estimators .....	Summary Estimation and Disclosure Methodology Branch	(202) 720-4008	HQ_SD_SMB@nass.usda.gov
Dissemination .....	Data Dissemination Office	(202) 720-3869	HQ_SD_DDO@nass.usda.gov
Media Contact and Webmaster ..	Public Affairs Office	(202) 720-2639	HQOAPAO@nass.usda.gov

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