



Cash Rents Methodology and Quality Measures

ISSN: 2167-129X

Released August 5, 2015, by the National Agricultural Statistics Service (NASS), Agricultural Statistics Board, United States Department of Agriculture (USDA).

Survey Methodology for Cash Rents

Scope and Purpose: The June Area Survey is conducted annually and obtains acres rented and cash rental rates from farmers and ranchers in the United States excluding Alaska and Hawaii. The survey provides the basis for estimates of the current year's cash rents paid for irrigated cropland, non-irrigated cropland, and permanent pastureland. Estimates of irrigated and non-irrigated pastureland are not established due to the scarcity of irrigated pastureland. State level cash rent estimates are published, pending compliance with disclosure rules and publication standards.

The cash rents estimates derived from this survey supply basic information needed by farmers to make decisions for both short-term and long-term planning. These estimates may be used by individual producers in planning for their agricultural operation or by Agricultural Extension Services or university staff in developing operating budgets for agricultural operations in their locale.

Survey Timeline: during June, cash rents data are collected on the June Area Survey. National and state level cash rents estimates are published in August for all states, excluding Alaska and Hawaii.

Sampling: The target population for the cash rents estimate program is all farms and ranches with \$1,000 or more in agricultural sales (or potential sales) who rent land from others on a cash rent basis.

The June Area Survey utilizes an area sampling frame for national and state level estimates. The area frame contains all land in the United States (except Alaska) and is therefore complete for the cash rents program. The frame in each state is divided into segments of land. For more intense agricultural regions, segments are about one square mile in size. An optimal sample is selected in each state with a national sample size of about 11,000.

Data Collection: All federal data collections require approval by the Office of Management and Budget (OMB). NASS must document the public need for the data, show the design applies sound statistical practice, ensure the data does not already exist elsewhere, and show that the public is not excessively burdened. 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 that response to the survey is voluntary and not required by law.

Data collection for the June Area Survey is conducted by a personal interview. Enumerators must account for all operations and land contained in their assigned segments. Enumerators interview and collect responses from the end of May through mid June. Survey questionnaires are returned to Regional Field Offices (RFOs) where they are visually reviewed and key entered.

Survey Edit: As survey data are collected and captured, they 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 on the current survey are verified and, in certain situations, items are compared to data from earlier surveys to make sure certain relationships are logical. The edit determines the status of each record to be either "dirty" or "clean" (i.e., failing or passing the edit requirements for consistency and reasonableness). Dirty records must be updated and re-edited, or certified by an analyst to be accurate. Corrected data are re-edited interactively. Only clean records are eligible for analysis tools and summary.

Analysis Tools: Edited survey records are processed and analyzed with interactive data 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 and unusual data relationships are revealed by the analysis tool. RFO and Headquarters (HQ) 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 errors are present in any survey process. These errors include reporting, recording, editing, and imputation errors. 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.

Nonresponse Adjustment: Response to the June Area 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 cash rental rates are to be made. For the June Area Survey, item level nonresponse is accounted for by imputing data where there are missing values. Imputed values are calculated through an automated imputation algorithm that requires a minimum of five complete reports within the imputation group to calculate the imputed value. When a group lacks a sufficient number of responses, groups are collapsed according to a defined hierarchy, preserving as much of the homogeneity as possible, until five complete reports are identified. The first imputation group is reports within the same segment. If five complete reports are not found, the imputation algorithm then moves on to reports within the same county and similar strata, then all reports in the same county, followed by all reports in the same district, and lastly, all reports in the state.

Estimators: The June Area Survey uses an area frame ratio estimator that calculates the weighted average rental rate by taking the ratio of total rent paid to total acres rented. Cash rent items pertain to the entire farm level and are weighted by the original segment sampling weight and by the proportion of the farm residing inside the segment boundaries. Ratio indications are calculated including and excluding imputed data.

Outliers: NASS conducts a review of outliers found in cash rents data by reviewing rental rates for all records by practice (irrigated cropland, non-irrigated cropland, or permanent pastureland). RFO and HQ staff work together to review outliers and to ensure the most accurate data possible. A determination is made as to whether an adjustment to the cash rental rate estimate is required. Most outliers trace back to unique situations that do not exist in the target population as much as the survey weight would indicate.

Estimation: When all samples are accounted for, all responses fully edited, and the analysis material reviewed, each RFO executes summaries that generate state, district, and county level totals and ratios. The summary results provide multiple point and ratio estimates and information used to assess the performance of the survey and evaluate the quality of the survey estimates. RFOs are responsible for performing a detailed review of their survey data, interpreting the June Area Survey indications, and submitting state level estimate recommendations to HQ. Staff must provide justification to the Agricultural Statistics Board (ASB) in cases where recommendations deviate from survey results. The ASB reviews all state, district, and county level recommendations and establishes official estimates.

Quality Metrics for Cash Rents

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 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 evaluated by the coefficient of variation for each estimated item. Non-sampling error is evaluated by response rates.

Farm Tract is a portion of a sampled segment that represents a unique operating arrangement that meets the definition of a farm.

Sample Size is the total number of farm tracts found in the sample segments in the June Area Survey excluding tracts on American Indian Reservations in Arizona, Nevada, New Mexico, and Utah and tracts in public and non-agricultural land use strata in all States.

Response rates measure the proportion of the farm tracts that qualify for cash rents on the June Area Survey.

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.

June Area Survey Cash Rents Sample Size and Response Rates: To assist in evaluating the performance of the estimates in the Cash Rents report, the sample size and response rates are displayed. The sample size changes from year to year as the number of farm tracts identified within the sampled segments varies.

Cash Rents Quality Measures – States and United States: 2015

State	Sample Size	Response Rate	Coefficient of variation		
			Irrigated cropland	Non-irrigated cropland	Pastureland
	(number)	(percent)	(percent)	(percent)	(percent)
Northeast	1,705	75.8	8.8	3.6	(NA)
Connecticut	29	82.8	(NA)	(NA)	(NA)
Delaware	86	50.0	(NA)	(NA)	(NA)
Maine	51	68.6	(NA)	(NA)	(NA)
Maryland	190	81.1	(NA)	6.7	(NA)
Massachusetts	46	76.1	(NA)	(NA)	(NA)
New Hampshire	21	71.4	(NA)	(NA)	(NA)
New Jersey	168	81.5	(NA)	(NA)	(NA)
New York	326	76.4	(NA)	5.1	(NA)
Pennsylvania	642	77.4	(NA)	6.6	(NA)
Rhode Island	39	53.8	(NA)	(NA)	(NA)
Vermont	107	77.6	(NA)	(NA)	(NA)
Lake	3,344	81.8	7.4	1.4	1.4
Michigan	728	76.4	4.9	3.1	(NA)
Minnesota	1,671	84.0	10.9	1.8	1.8
Wisconsin	945	82.3	10.5	3.1	3.1
Corn Belt	7,316	77.4	1.7	0.7	0.7
Illinois	1,765	75.9	1.6	1.4	1.4
Indiana	1,033	79.0	2.3	1.3	(NA)
Iowa	1,923	86.1	(NA)	0.7	0.7
Missouri	1,621	66.7	3.5	2.0	1.9
Ohio	974	79.3	(NA)	1.7	(NA)
Northern Plains	5,932	59.2	2.0	1.8	1.8
Kansas	1,587	53.3	3.1	5.2	4.5
Nebraska	1,626	64.9	1.9	3.9	2.4
North Dakota	1,541	65.3	2.4	2.0	2.0
South Dakota	1,178	51.1	1.7	2.7	2.6
Appalachian	3,739	80.1	7.9	2.5	2.4
Kentucky	776	68.3	(NA)	5.6	5.6
North Carolina	997	73.8	16.7	3.3	3.3
Tennessee	1,122	89.9	2.8	3.7	3.6
Virginia	541	82.8	10.2	3.0	4.0
West Virginia	303	89.8	(NA)	13.2	(NA)

(NA) Not available.

Cash Rents Quality Measures – States and United States: 2015 (continued)

State	Sample Size	Response Rate	Coefficient of variation		
			Irrigated cropland	Non-irrigated cropland	Pastureland
	(number)	(percent)	(percent)	(percent)	(percent)
Southeast	2,115	79.8	3.2	2.9	9.9
Alabama	683	84.6	15.4	5.6	6.0
Florida	314	72.0	0.9	9.8	19.9
Georgia	790	77.6	1.8	3.8	6.1
South Carolina ...	328	82.6	11.7	5.2	(NA)
Delta	2,358	85.8	1.5	3.1	7.5
Arkansas	969	83.0	2.4	9.5	13.4
Louisiana	663	84.8	6.5	4.1	10.1
Mississippi	726	90.5	1.8	4.0	7.2
Southern Plains	4,973	77.1	5.4	3.8	4.4
Oklahoma	1,095	61.6	13.4	3.1	4.0
Texas	3,878	81.5	5.9	5.0	5.4
Mountain	3,382	74.6	5.2	5.7	7.2
Arizona	287	86.4	8.0	(NA)	(NA)
Colorado	715	60.6	6.0	7.9	15.2
Idaho	528	73.7	7.2	2.6	29.1
Montana	992	81.1	8.0	3.7	5.2
Nevada	33	60.6	(NA)	(NA)	(NA)
New Mexico	402	75.4	(NA)	(NA)	(NA)
Utah	258	75.6	6.6	(NA)	(NA)
Wyoming	167	77.8	(NA)	(NA)	(NA)
Pacific	2,152	72.0	9.3	9.2	21.4
California	847	74.9	11.7	(NA)	26.8
Oregon	618	78.8	15.9	8.9	7.8
Washington	687	62.3	9.8	6.6	(NA)
United States	37,016	75.1	4.1	0.8	3.7

(NA) Not available.

Information Contacts

Process	Unit	Telephone	Email
Estimation	Environmental, Economics, and Demographics Branch	(202) 720-6146	HQ_SD_EEDB@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_MD_SEIMB@nass.usda.gov
Summary and Estimators	Summary Estimation and Disclosure Methodology Branch	(202) 720-4008	HQ_MD_SEDMB@nass.usda.gov
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