



Cash Rents Methodology and Quality Measures

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Cash Rents Survey Methodology

Scope and Purpose: The Cash Rents Survey is conducted annually and obtains acres rented and cash rental rates from farmers and ranchers in the United States. This 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, district, and county level cash rent estimates are published for all states excluding Alaska, pending compliance with disclosure rules and publication standards.

Estimates derived from this survey supply basic information needed by farmers to make decisions for both short-term and long-term planning. The cash rents 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.

The National Agricultural Statistics Service (NASS) was directed through the 2008 Farm Bill to collect cash rents data for use by the Farm Service Agency (FSA) in program administration. The Food, Conservation, and Energy Act of 2008, Section 2110, states, "The Secretary (acting through the National Agricultural Statistics Service) shall conduct an annual survey of per acre estimates of county average market dry land and irrigated cash rental rates for cropland and pastureland in all counties or equivalent subdivisions within each state that have 20,000 acres or more of cropland and pastureland."

Survey Timeline: The Cash Rents Survey data collection period is from mid-February through the beginning of July. Data collection is coordinated with other surveys being conducted during this period. Also during June, cash rents data are collected on the June Area Survey (JAS). National, regional, and state level cash rents estimates are published in August for all states excluding Alaska. District and county level cash rents estimates are published in September.

Sampling: The target population for Cash Rents Survey is all farms and ranches with \$1,000 or more in agricultural sales (or potential sales) who rent land from others. A sample is selected from the NASS List Frame. NASS maintains a list of farm and ranch operators. NASS is constantly seeking new operations from outside list sources confirmed to be qualifying farms before being added to the list. A profile, known as control data, of each operation is maintained which indicates what the farm has historically produced and a general indication of size. This information allows NASS to define sampling populations that are specific to each survey and employ advanced and more efficient sample designs.

Samples for the Cash Rents Survey are drawn with a county level stratified design to produce state, district, and county level estimates. Large operations in each county are stratified into the census strata, where all are included in the sample. The national sample size for the Cash Rents Survey is approximately 240,000.

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 do not already exist elsewhere, and show that the public is not excessively burdened. The cash rents 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 Cash Rents Survey is mainly conducted by mail and telephone. The initial mail-out occurs in mid-February followed by a second mailing in mid-March. A letter is enclosed with a questionnaire for the respondent to complete and return by mail. The questionnaire can also be completed securely online. Non-response phone follow-up is conducted using Computer Assisted Telephone Interviews (CATI) at Data Collection Centers from April to July. Personal interviews are limited to large operations or those with special handling arrangements. Additionally, if necessary, follow-up to operations that had previously been contacted by phone was conducted by Computer-Assisted Personal Interviewing (CAPI). Use of this means of data collection was available in 24 Field Offices (FO).

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 the FO 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 cash rents data are processed through an interactive analysis tool which displays data for all reports by item. The tool provides various scatter plots, tables, charts, and special tabulations that allow the analyst to compare an individual record to other similar records within their state, district, and county. Outliers and unusual data relationships are investigated by FO and Headquarters (HQ) staff to determine if they are correct. Suspect data found to be in error are corrected, while data found to be correct 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, detailed computer edits, and the analysis tool.

Nonresponse Adjustment: Response to the Cash Rents 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 this survey, nonresponse adjustments are made by reweighting techniques applied to the data from reporting farms and ranches.

Estimators: The cash rents surveys utilize direct expansions and/or ratio expansions for all survey indications. For both list and area frame survey respondents, direct expansions are calculated by applying sampling weights and nonresponse adjustments to reported data and summing these values. Similarly, ratios are calculated by applying sampling weights and nonresponse adjustments to data when both the numerator and denominator are reported.

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). FO and HQ staff work together to ensure the most accurate data possible. The FO staff reviews outliers within their state, and the HQ statistician examines outliers across all states. 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 FO 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 current survey and evaluate the quality of the survey estimates. FOs are responsible for performing a detailed review of their survey data, interpreting the survey indications, and 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.

Cash Rents Survey Sample Size and Response Rate – States and United States: 2011 and 2012

| State | Sample size | | Response rate | |
|----------------------|------------------|------------------|-------------------|-------------------|
| | 2011 (number) | 2012 (number) | 2011 (percent) | 2012 (percent) |
| Alabama | 5,448 | 5,127 | 81.6 | 76.8 |
| Arizona | 901 | 945 | 90.3 | 87.1 |
| Arkansas | 5,816 | 5,692 | 79.8 | 74.9 |
| California | 6,074 | 6,566 | 76.3 | 78.9 |
| Colorado | 3,806 | 4,284 | 78.5 | 77.9 |
| Connecticut | 421 | 433 | 77.7 | 80.6 |
| Delaware | 293 | 322 | 77.5 | 57.5 |
| Florida | 2,576 | 2,532 | 75.7 | 73.4 |
| Georgia | 5,144 | 5,206 | 72.6 | 76.2 |
| Hawaii | 503 | 540 | 81.1 | 83.7 |
| Idaho | 3,303 | 3,558 | 81.4 | 78.9 |
| Illinois | 9,489 | 9,594 | 76.0 | 75.2 |
| Indiana | 8,251 | 8,325 | 62.5 | 62.8 |
| Iowa | 12,274 | 12,610 | 69.1 | 66.4 |
| Kansas | 10,511 | 10,431 | 69.2 | 68.7 |
| Kentucky | 7,016 | 6,857 | 81.2 | 77.4 |
| Louisiana | 3,595 | 3,544 | 81.7 | 81.1 |
| Maine | 564 | 570 | 81.9 | 84.0 |
| Maryland | 1,625 | 1,806 | 77.4 | 62.5 |
| Massachusetts | 650 | 641 | 79.5 | 81.6 |
| Michigan | 5,752 | 5,604 | 75.4 | 75.2 |
| Minnesota | 9,439 | 9,150 | 74.2 | 70.6 |
| Mississippi | 4,638 | 4,483 | 83.2 | 77.7 |
| Missouri | 10,944 | 10,818 | 72.0 | 68.4 |
| Montana | 4,433 | 4,827 | 77.1 | 74.6 |
| Nebraska | 10,765 | 12,212 | 73.4 | 67.6 |
| Nevada | 392 | 402 | 83.2 | 81.1 |
| New Hampshire | 256 | 258 | 77.3 | 82.9 |
| New Jersey | 929 | 969 | 84.1 | 79.1 |
| New Mexico | 2,077 | 2,111 | 75.5 | 76.6 |
| New York | 4,176 | 4,144 | 77.5 | 73.9 |
| North Carolina | 7,780 | 7,683 | 74.7 | 76.8 |
| North Dakota | 6,438 | 6,437 | 70.9 | 64.2 |
| Ohio | 7,767 | 7,507 | 73.3 | 74.4 |
| Oklahoma | 8,435 | 7,733 | 71.6 | 75.1 |
| Oregon | 3,311 | 3,551 | 81.2 | 79.2 |
| Pennsylvania | 4,558 | 5,395 | 78.1 | 74.5 |
| Rhode Island | 128 | 130 | 75.0 | 77.7 |
| South Carolina | 2,707 | 2,685 | 83.2 | 81.1 |
| South Dakota | 7,634 | 7,448 | 67.6 | 70.2 |
| Tennessee | 6,970 | 6,987 | 84.8 | 86.0 |
| Texas | 19,928 | 19,363 | 81.8 | 79.2 |
| Utah | 2,458 | 2,609 | 85.5 | 82.7 |
| Vermont | 756 | 767 | 79.8 | 84.7 |
| Virginia | 5,727 | 5,690 | 76.9 | 75.5 |
| Washington | 2,902 | 3,063 | 80.9 | 81.0 |
| West Virginia | 1,611 | 1,580 | 83.5 | 80.9 |
| Wisconsin | 7,033 | 7,165 | 80.9 | 78.8 |
| Wyoming | 1,756 | 1,841 | 84.7 | 80.3 |
| United States | 239,960 | 242,195 | 76.0 | 74.3 |

⁰ Not published due to insufficient reports.

Cash Rents Survey Coefficient of Variation – States and United States: 2011 and 2012

| State | Coefficient of variation | | | | | |
|----------------------|--------------------------|----------|------------------------|----------|-------------|----------|
| | Irrigated cropland | | Non-irrigated cropland | | Pastureland | |
| | 2011 | 2012 | 2011 | 2012 | 2011 | 2012 |
| | (number) | (number) | (number) | (number) | (number) | (number) |
| Alabama | 7.6 | 8.7 | 2.5 | 2.7 | 1.9 | 2.2 |
| Arizona | 10.3 | 8.0 | (S) | (S) | 57.2 | 19.8 |
| Arkansas | 4.6 | 3.3 | 8.4 | 8.1 | 3.7 | 4.7 |
| California | 7.6 | 6.3 | 17.0 | 13.4 | 9.7 | 9.2 |
| Colorado | 8.1 | 4.6 | 4.7 | 4.3 | 5.9 | 6.8 |
| Connecticut | (S) | (S) | 9.4 | 8.1 | (S) | (S) |
| Delaware | 2.1 | 7.2 | 3.6 | 7.2 | (S) | (S) |
| Florida | 14.6 | 14.0 | 5.5 | 5.9 | 6.1 | 6.9 |
| Georgia | 4.6 | 3.2 | 3.0 | 3.8 | 7.9 | 5.6 |
| Hawaii | 34.6 | 28.3 | 18.7 | 31.0 | 14.0 | 24.4 |
| Idaho | 3.5 | 4.6 | 8.6 | 13.3 | 18.5 | 17.2 |
| Illinois | 3.4 | 4.2 | 1.9 | 1.5 | 5.7 | 6.4 |
| Indiana | 6.3 | 4.2 | 1.3 | 1.2 | 11.0 | 4.8 |
| Iowa | 2.9 | 8.6 | 1.0 | 1.2 | 4.1 | 1.9 |
| Kansas | 3.5 | 3.1 | 1.9 | 3.6 | 2.6 | 1.8 |
| Kentucky | 8.9 | 9.7 | 3.0 | 3.1 | 3.2 | 5.1 |
| Louisiana | 3.5 | 4.0 | 4.7 | 5.3 | 7.2 | 8.8 |
| Maine | (S) | (S) | 10.8 | 7.0 | (S) | (S) |
| Maryland | 3.6 | 19.7 | 2.8 | 5.8 | 5.1 | 10.8 |
| Massachusetts | 10.6 | 15.7 | 10.0 | 17.7 | (S) | (S) |
| Michigan | 5.7 | 7.7 | 2.5 | 3.4 | 10.7 | 11.2 |
| Minnesota | 3.7 | 8.0 | 1.1 | 2.3 | 7.0 | 6.1 |
| Mississippi | 1.0 | 2.3 | 2.4 | 4.4 | 7.3 | 5.1 |
| Missouri | 6.0 | 3.8 | 5.4 | 3.9 | 2.6 | 2.6 |
| Montana | 5.6 | 5.7 | 3.9 | 3.1 | 7.6 | 5.0 |
| Nebraska | 0.7 | 1.5 | 1.9 | 1.9 | 3.3 | 4.1 |
| Nevada | 7.8 | 15.8 | (S) | (S) | 18.9 | 23.7 |
| New Hampshire | (S) | (S) | 12.2 | 10.8 | (S) | (S) |
| New Jersey | 8.9 | 2.6 | 3.7 | 6.1 | (S) | 12.1 |
| New Mexico | 8.5 | 18.4 | 17.7 | 24.0 | 24.8 | 9.8 |
| New York | 21.9 | 16.0 | 2.4 | 4.0 | 40.3 | 31.5 |
| North Carolina | 5.1 | 5.6 | 2.0 | 2.5 | 7.5 | 4.0 |
| North Dakota | 9.7 | 4.4 | 1.7 | 3.9 | 1.9 | 2.7 |
| Ohio | 7.6 | 23.9 | 2.1 | 3.3 | 6.0 | 14.9 |
| Oklahoma | 7.4 | 16.0 | 2.0 | 3.3 | 3.2 | 3.0 |
| Oregon | 6.6 | 9.5 | 5.5 | 7.9 | 8.2 | 14.1 |
| Pennsylvania | 19.6 | 7.8 | 5.2 | 6.7 | 13.7 | 29.4 |
| Rhode Island | (S) | (S) | (S) | (S) | (S) | (S) |
| South Carolina | 6.8 | 7.8 | 2.1 | 2.3 | 3.0 | 3.1 |
| South Dakota | 8.8 | 6.4 | 2.5 | 5.2 | 8.4 | 5.2 |
| Tennessee | 4.4 | 4.1 | 3.5 | 2.5 | 3.2 | 2.6 |
| Texas | 3.9 | 4.8 | 14.7 | 5.2 | 14.3 | 4.4 |
| Utah | 6.3 | 8.1 | 19.3 | 14.9 | 12.6 | 16.9 |
| Vermont | (S) | (S) | 9.1 | 4.6 | 15.2 | 7.4 |
| Virginia | 7.5 | 9.6 | 4.2 | 3.0 | 4.5 | 5.2 |
| Washington | 4.6 | 10.1 | 8.1 | 11.4 | 10.8 | 30.0 |
| West Virginia | (S) | (S) | 13.6 | 16.9 | 5.7 | 5.0 |
| Wisconsin | 7.4 | 5.4 | 2.0 | 2.8 | 7.0 | 5.3 |
| Wyoming | 5.9 | 2.8 | 7.3 | 2.0 | 3.6 | 2.0 |
| United States | (NA) | (NA) | (NA) | (NA) | (NA) | (NA) |

(NA) Not available.

(S) Insufficient number of reports to establish an estimate.

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