Appendix A.
Census of Agriculture Methodology

The purpose of a census is to enumerate all objects with a defined characteristic. For the census of agriculture, that goal is to account for "any place from which $1,000 or more of agricultural products were produced and sold, or normally would have been sold, during the census year." To do this, NASS creates a Census Mail List (CML) of agricultural operations that potentially meet the farm definition, collects agricultural information from those operations, reviews the data, corrects or completes the requested information, and combines the data to provide information on the characteristics of farm operations and farm producers at the national, State, and county levels. In this appendix, these census processes are described.

THE CENSUS POPULATION

The Census Mail List

The National Agricultural Statistics Service (NASS) maintains a list of farmers and ranchers from which the CML is compiled. The goal is to build as complete a list as possible of agricultural places that meet the farm definition. The CML compilation begins with the list used to define sampling populations for NASS surveys conducted for the agricultural estimates program. Each record on the list includes name, address, telephone number, and email plus additional information that is used to efficiently administer the census of agriculture and agricultural estimates programs.

NASS builds and improves the list on an ongoing basis by obtaining outside source lists. Sources include State and federal government lists, producer association lists, seed grower lists, pesticide applicator lists, veterinarian lists, marketing association lists, and a variety of other agriculture-related lists. NASS also obtains special commodity lists to address specific list deficiencies. These outside source lists are matched to the NASS list using record linkage programs. Most names on newly acquired sources are already on the NASS list. Records not on the NASS list are treated as potential farms until NASS can confirm their existence as a qualifying farm. Staff in NASS regional and field offices routinely contact these potential farms to determine whether they meet the farm definition. For the 2017 Census of Agriculture, NASS made a concerted effort to work with community-based organizations not only to improve list coverage for minorities but also to increase census awareness and participation.

List building activities for developing the 2017 CML started in 2014 by updating list information from respondents to the 2012 Census of Agriculture. Between 2015 and 2017, NASS conducted a series of National Agricultural Classification Surveys (NACS) on approximately 1.6 million records, which included nonrespondents from the 2012 census and newly added records from outside list sources. The NACS report forms collected information that was used to determine whether an operation met the farm definition. If the definition was met, the operation was added to the NASS list and subsequently to the CML. Addressees that were nonrespondents to a NACS were also added to the CML and identified with a special status code.

Measures were taken to improve name and address quality. Additional record linkage programs were run to detect and remove duplicate records both within each State and across States. List addresses were processed through software programs that utilize the United States Postal Service's National Change of Address System and the Locatable Address Conversion System to improve mail delivery. Records on the list with missing or invalid phone numbers were matched against a nationally available telephone database to obtain as many phone numbers as possible. To reduce costs, operations with characteristics that indicated they were unlikely to be farms, according to the farm definition, were removed from the list.

The official CML for the 2017 Census of Agriculture was established on September 3, 2017. The list contained 2,999,098 records. Of these, 2,259,750 records were thought to meet the NASS farm definition and 739,348 were potential farm records, which included NACS nonrespondents, other records added to the CML by the NASS regional field offices after the record linkage process, and late adds to the CML that were not included in any previous NACS or State screening survey.

Not on the Mail List (NML)

Extensive efforts are directed toward developing a CML that includes all farms in the U.S. However, some farms are not on the list, and some agricultural operations on the list are not farms. NASS uses its June Area Survey (JAS) to quantify the number and types of farms not on the CML. The records in the JAS that are not on the CML are said to be in the Not-on-the-Mail List (NML) domain. If a JAS record in the NML domain is determined to be a farm during the census, it is an NML farm. The NML farms are used to measure coverage associated with the census.

The JAS is based on an area frame, which covers all land in the U.S. and includes all farms. The land in the U.S. is stratified by characteristics of the land. A probability sample of segments is drawn within each stratum for the JAS. Segments of approximately equal size are delineated within each stratum and designated on aerial photographs. The JAS sample of segments is allocated to strata to provide accurate measures of acres planted to widely grown crops, farm numbers, and inventories of cattle. Sampled segments in the JAS are personally enumerated. Each operation identified within a segment boundary is known as a tract.

The 2017 JAS sample was increased to improve the farm counts for operations that produced specialty commodities or had socially disadvantaged or minority producers. The total JAS sample consisted of 13,972 segments of which 3,012 were additional segments. This set of additional segments is referred to as the Agricultural Coverage Evaluation Survey (ACES) segments. The ACES segments were selected using a multivariate sampling design that targeted specific items at the U.S. level. The 2017 JAS consisted of sample segments from all States, with the exception of Alaska where NASS does not maintain an area frame.

During the JAS/ACES enumeration process, each tract is identified as either agricultural or non-agricultural. Each JAS/ACES agricultural tract is identified as a farm or non-farm in June based on the farm definition of $1,000 of sales or potential sales of agricultural products. Non-agricultural tracts are further classified into categories: with farm potential, with unknown farm potential, or with no farm potential. The names and addresses collected in the 2017 JAS/ACES were matched to the CML. Those from the 2017 JAS/ACES that did not match were determined to be in the NML domain and sent a yellow census report form so that they could be differentiated from the green report form sent to those addressees on the CML. Instructions on the census report form directed any respondent who received duplicate forms to complete the CML form and to mail all duplicate forms back together. Those who returned a CML and an NML form had been misclassified as NML and were removed from the NML domain.

The initial NML mailout consisted of 42,430 records. A total of 41,787 NML records were summarized of which 2,799 records were confirmed to be NML and in-scope.

The farm/nonfarm status of each NML domain operation was determined based on the reported data in the census form. An operation in the NML domain that was determined to be a farm is referred to as an NML farm. Characteristics of NML farms and their producers provided a measure of the undercoverage of farms on the CML. The percentage of farms not represented on the CML varied by State. In general, NML farms tended to be small in acreage, production, and sales of agricultural products. Farm operations were missing from the CML for various reasons, including the possibility that the operation started after development of the CML, the operation was so small that it did not appear in any agriculture-related source list, or the operation was misclassified as a nonfarm prior to census mailout. The CML was used with the NML in a capture-recapture framework to represent all farming operations across all States in the JAS sample.

DATA COLLECTION OUTREACH AND PROMOTIONAL EFFORTS

NASS planned and executed a multi-phase strategic communications campaign for the 2017 Census of Agriculture, to increase the level of awareness and response among all U.S. agricultural producers.

- Phase 1 ran from December 2016 − June 2017. It raised awareness about the census and list building, encouraged producers to sign up in response to NASS mailings and at community, association, and other stakeholder meetings where NASS partners reached out.

- Phase 2 ran from July 2017 − December 2017. It notified farm producers and agricultural organizations that the census would be mailed in December, and encouraged communications regarding the census.

- Phase 3 ran from December 2017 – July 2018. It focused on census data collection with messaging urging response, reminding producers that it was not too late to respond.

- Phase 4 ran from August 2018 – February 2019. It thanked producers for their participation and NASS partners for their support, and informed all of the February 2019 data release plan.

The communications campaign focused on these primary areas: partnership building, local-level outreach, public relations, media relations, paid media, and social media. Some external support was provided by a private communications agency (i.e. primarily assistance with paid media/advertising strategy and ad creation) and a freelance writer.

The unifying force behind the 2017 communications campaign was the theme "Your Voice. Your Future. Your Opportunity." This was accompanied by supporting messages and artwork that created a consistent look and feel for all census communications. All messages and materials served the purpose of inspiring action: *Grow Your Farm Future - Shape Your Farm Programs - Boost Your Rural Services - Fill out your Census of Agriculture - Do your part to be counted - The Census of Agriculture is Your Voice, Your Future, Your Opportunity*.

Partnership and Local-Level Outreach

At the national level, NASS officials met with leaders from dozens of agricultural organizations, State Departments of Agriculture, and other USDA agencies to successfully secure their support in promoting the census among their constituencies. Stakeholders partnered with NASS to promote the 2017 Census of Agriculture through publications (e.g. newsletters), special mailings, speeches, social media, websites, and other communications. In addition, through grassroots-level outreach and efforts, NASS partnered with a number of community-based organizations to reach minority and limited-resource farmers and ranchers. National-level outreach was encouraged and mirrored at the regional, State, and local levels. Among the highlights of these partnership efforts was the production of multiple television and radio public service announcements featuring the U.S. Secretary of Agriculture, State secretaries, directors, and commissioners of agriculture and leaders from community-based organizations.

Coverage of American Indian and Alaska Native Farm Producers

To maximize coverage of American Indian and Alaska Native agricultural producers, special procedures were followed in the census. A concerted effort was made to get individual reports from every American Indian and Alaska Native farm or ranch producer in the country. If this was not possible within some reservations, a single reservation-level census report was obtained from knowledgeable reservation officials. These reports covered agricultural activity on the entire reservation. NASS staff reviewed these data and removed duplication with any data reported by American Indian or Alaska Native producers who responded on an individual census report form. Additionally NASS obtained, from knowledgeable reservation officials, the count of American Indian and Alaska Native producers (on reservations) who were not counted through individual census report forms, but whose agricultural activity was included in the reservation-level report form.

Table D, **American Indian and Alaska Native Producers: 2017** provides the number of producers (1) reported as American Indian or Alaska Native in the race category, either as a single race or in combination with other races, on the individual census report forms (for up to four per farm) and (2) identified as American Indian or Alaska Native producers farming on reservations by reservation officials. The count from the individual report forms is summarized in the "Individually reported" column. It includes up to four producers on or off reservations. The "Other" column provides counts of producers on reservations as reported by a reservation or tribal official. The "Total" column is simply a sum of the "Individually reported" and the "Other" columns. Tables in other parts of the publication count the reservation-level reports as single farms.

Public Relations

In the public relations arena, NASS worked with internal and external stakeholders to equip them with communications tools and resources to deliver the census communications message to their audiences. NASS utilized its Intranet and the Partner Tools page on the census website to deliver materials to the 12 regional and 46 field offices as well as to external stakeholders. The materials included but were not limited to: customizable news releases, public service announcement scripts, and a PowerPoint template; Secretary of Agriculture video public service announcements, and drop-in advertisements; informational, instructional, and testimonial videos; website buttons and banners; brochures in multiple languages; flyers; posters; FAQ sheets, talking points, and more. In addition, at the national level, NASS issued six news releases during data collection (three more were produced before data collection to inform and prepare producers) citing department and agency spokespeople, published half a dozen timely and relevant pieces to the USDA blog highlighting the census, and conducted three social media campaigns. These public relations efforts at the national and local-levels helped ensure that NASS' message about the census was continually in the media, including print and online publications, a variety of social media, radio, and some television programs. Media outlets included both those specializing in agriculture and more general outlets.

Paid Media

Even with increasingly limited budgets and resources, NASS was able to apply a small portion of funds toward paid media. For the 2017 Census of Agriculture, NASS strategically advertised in regional print publications, online, and with national agriculture news services (i.e. TV, radio) to bolster reach both in general and within geographically-specific, previously under-represented populations and lower response areas.

DATA COLLECTION

Method of Enumeration

Data collection was accomplished primarily by mail, Computer-Assisted Self Interview (CASI) on the Internet, and personal enumeration for special classes of records in the census operations. Personal enumeration (interviewing) involved the use of both Computer-Assisted Telephone Interview (CATI) and Computer-Assisted Personal Interview (CAPI) data collection instruments. Enumerators at the five NASS Data Collection Centers conducted CATI data collection. In addition, enumerators under contract with NASS through the National Association of State Departments of Agriculture (NASDA) conducted phone and personal interviews with respondents. For the 2017 Census of Agriculture, NASS implemented a pre-notification strategy in an effort to increase awareness, improve overall responses, and encourage respondents to report early to avoid continued correspondence. All records with an e-mail address received an e-mail message marketing the improved web form and announcing the census mail packets were coming.

Report Forms

Four versions of report forms were used for the 2017 Census of Agriculture:

- General form (17-A100)
- Short form (17-A200)
- Hawaii form (17-A101)
- American Indian form (17-A300)

The general form facilitated reporting crops and livestock most commonly grown and raised in the U.S. The short form expedited reporting specific crops or livestock for pre-identified farms and ranches in the U.S. The Hawaii form targeted crops and

livestock specifically grown or raised on farms and ranches in Hawaii. The American Indian form focused on crops and livestock for farms and ranches on reservations in Arizona, New Mexico, and Utah. All of the report forms allowed respondents to write in specific commodities that were not prelisted on their report form.

Report Form Mailings

Pre-notification of census data collection began on November 17, 2017. Approximately 600,000 producers with an active e-mail address on the census mail list received a message informing them of the upcoming census data collection period and encouraging them to utilize the new census web form. Between November 27 and November 30, 2017, approximately 1 million producers received a letter with their survey code and instructions for completing their census online. The letter encouraged producers to report online early to avoid receiving mail and phone follow-up. Approximately 3 million mail packets were mailed in December 2017 and January 2018. Each packet contained a cover letter, instruction sheet, a labeled report form, and a return envelope. The Census Bureau's National Processing Center (NPC) in Jeffersonville, IN was contracted to perform mail packet preparation, initial mailout, and two follow-up mailings to nonrespondents.

The initial mailout was followed by a thank-you reminder postcard that was delivered in January 2018 to all operations that received mail packets. First follow-up mail packets were mailed in mid-February 2018 to approximately 1.5 million nonrespondents. Second follow-up mail packets were mailed in mid-March 2018 to approximately 1 million nonrespondents.

Nonresponse Follow-up

Operating concurrently with NPC's mail data collection efforts, NASS Data Collection Centers targeted selected groups of census nonrespondents for telephone enumeration. NASS regional field offices targeted selected groups of census nonrespondents for in-person enumeration. These efforts were referred to as:

- Must Case Follow-up
- American Indian Producer Follow-up
- National Nonresponse Follow-up
- Not on Mail List (NML) Follow-up

Must Case Follow-up. Must cases are known large or unique operations, the absence of which could have significantly affected the accuracy of census results. For the 2017 Census of Agriculture, 125,697 records were categorized as Must cases. Each active Must operation was accounted for by mail receipt, phone interview, or personal enumeration; if an operation was no longer in business, its nonfarm status was documented. Call centers conducted CATI calling of nonrespondent Must cases from March 2018 through May 2018, after the initial and first follow-up mailings. Following the CATI calling, the remaining nonresponse Must cases were assigned to regional field offices for personal enumeration. Because of the potential importance of Must cases, they were all accounted for and therefore not eligible for nonresponse weighting adjustment.

American Indian Producer Follow-up. The American Indian report form (17-A300) was mailed to all operations in Arizona, New Mexico and Utah thought to have an American Indian producer. It was included in the initial mailout, but due to poor mail response, a personal enumeration data collection strategy was utilized with no additional mail follow-up. A concerted effort was made to get individual reports from every American Indian farm producer in the country. If this was not possible within a reservation, a single reservation-level census report was obtained from knowledgeable reservation officials. These reports covered agricultural activity on the entire reservation. NASS staff reviewed these data and removed any duplicate data reported by American Indian producers from that reservation who responded on an individual census report form. Additionally NASS obtained, from knowledgeable reservation officials, the count of American Indian farm producers (on the reservations) who were not counted through individual census report forms, but whose agricultural activity was included in the reservation-level report form.

National Nonresponse Follow-up (Excludes Must Records). The National Nonresponse follow-up activity was designed to focus nonresponse follow-up in a manner that would both reflect the characteristics

of the nonresponders and increase response rates. In April 2018, a sample of 249,521 nonrespondents was selected from the remaining 864,260 nonrespondents using a stratified random design. The strata were based on State, county, size of farm, type of farm, producer race, and propensity to respond. Beginning in mid-April 2018 and continuing through July 2018, extensive efforts were made to collect data for the sampled records, including an additional CASI push, autodial calls, CATI, and CAPI. Records in the same stratum received the same set of collection methods. Of the 80,504 responses, 51,846 records were identified as being in-scope, resulting in a weighted farm count of 143,847 from the sample.

Not-on-the-Mail List (NML) Follow-up. To account for farming operations not on the CML, NASS used its 2017 JAS sample from the NASS area frame, augmented with the ACES segments. Because the NASS area frame covers all land in the U.S. with the exception of Alaska, it includes all farms. As previously described, NASS conducted a record linkage operation between the CML records and the records from the 2017 JAS/ACES. Those 2017 JAS records that did not match records on the CML were designated as "Not-on-the-Mail List" (NML) records. These records were mailed a yellow census form so that it could be differentiated from the green forms mailed to CML records. The NML records were mailed at the same time as the census mailing and received the same follow-up procedures as the census mailing through the first follow-up in mid-February 2018. Beginning in March 2018, CATI was used for nonresponse follow-up for NML nonrespondents.

REPORT FORM PROCESSING

Data Capture

The Census Bureau's National Processing Center (NPC) in Jeffersonville, IN was contracted to process returned mail packets. NASS staff on site at the NPC provided technical guidance and monitored NPC processing activities. All report forms returned to the NPC were immediately checked in, using bar codes printed on the mailing label, and removed from follow-up report form mailings. All forms with any data were scanned and an image was made of each page of a report form. Optical Mark Recognition (OMR) was used to capture categorical responses and to identify the other answer zones in which some type of mark was present.

Data entry operators keyed data from the scanned images using OMR results that highlighted the areas of the report forms with respondent entries. The keyer evaluated the contents and captured pertinent responses. Ten percent of the captured data were keyed a second time for quality control. If differences existed between the first keyed value and the second, an adjudicator handled resolution. The decision of the adjudicator was used to grade the performance of the keyers, who were required to maintain a certain accuracy level.

The images and the captured data were transferred to NASS's centralized network and became available to NASS analysts on a flow basis. The images were available for use in all stages of review.

Editing Data

Captured data were processed through a computer formatting program that verified that records were valid – that the record ID number was on the list of census records, that the reported counties of operation and production were valid, and other related criteria. Rejected records were referred to analysts for correction. Accepted records were sent to a complex computer batch edit process. Each execution of the computer edit in batch mode consisted of records from only one State and flowed as the data were received from NPC, the NASS Computer-Assisted Self Interview (CASI), or the Computer-Assisted Telephone Interview (CATI) applications.

The computer edit determined whether a reporting operation met the qualifying criteria to be counted as a farm (in-scope). The edit examined each in-scope record for reasonableness and completeness and determined whether to accept the recorded value for each data item or take corrective action. Such corrective actions included removing erroneously reported values, replacing an unreasonable value with one consistent with other reported data, or providing a value for an item omitted by the respondent. To the extent possible, the computer edit determined a replacement value. Strategies for determining replacement values are discussed in the next section. Operations failing to meet the qualifying criteria for being classified as a farm were categorized as out-of-scope for the census. Records that NASS had reason

to believe might have been erroneously classified as out-of-scope (indications of recent and/or significant agricultural activity reported on NASS surveys, for example) were referred to analysts for verification.

The edit systematically checked reported data section-by-section with the overall objective of achieving an internally consistent and complete report. NASS subject-matter experts had previously defined the criteria for acceptable data. Problems that could not be resolved within the edit were referred to an analyst for intervention. Prior to the census mail-out, NASS established a group of analysts in a Census Editing Unit in the National Operations Center in St. Louis, MO who examined the scanned images, consulted additional sources of information, and determined an appropriate action. Regional field office analysts also participated using an interactive version of the edit program to submit corrected data and immediately re-edit the record to ensure a satisfactory solution.

Short Form Editing

From the CML, 400,000 records were selected to receive a short form; this short form was derived from the full census report form by reducing a number of sections to a 'total' question – for example, instead of asking the respondent to report the acreage for each specific type of fruit or vegetable, the short form only asked for total fruit acreage or total vegetable acreage. In some cases, the same questions were asked on the general form, in which case the edit treated the short form responses as though they were incomplete general forms, as described in the previous paragraphs. In other cases, several items on the general form were collapsed – for example, total acres of Christmas trees and short rotation woody crops were asked as a single item on the short form, instead of separately as on the general form. In such cases, different approaches were taken in the edit to create a general form item or items from the short-form specific items. Any short form record that reported values above a certain threshold (in practice this threshold was 0 for almost all items) for these short-form-specific questions was 'flagged' by the edit; these records were later called back and the respondent asked for additional information about the items reported – for example, a producer reporting 10 acres of fruit on the short form was called back and asked for the total, bearing, and nonbearing acres for each type of fruit grown, as was asked on the general form. If the producer was successfully contacted and these additional data collected, the information was added to the record as additional reported data, and the edit was 'reset to original' – that is, the effects of the previous edit were undone – and the record was reedited with the new additional information. A flag was passed to the edit so that the short form record was not flagged for callback in such cases. In many cases, of course, it was not possible to recontact the respondent. In such cases, a flag was passed to the edit system, and the record was unlocked and available for review.

Imputing Data

The edit determined the best value to impute for reported responses that were deemed unreasonable and for required responses that were absent. If an item could not be calculated directly from other current responses, the edit determined whether acreage, production, or inventory items had been reported for that farm on a recent NASS crop or livestock survey. For producers who had not changed in five years, demographics such as race and gender were taken from the previous census. Administrative data from the Farm Service Agency were used for a few items, such as Conservation Reserve Program acreage. When deterministic edit logic and previously-reported data sources were unable to provide a current value, data from a reporting farm of similar type, size, and location were considered. In cases where automated imputation was unable to provide a consistent report, the record was referred to an analyst for resolution.

Separate system processes were established to efficiently provide data from a similar farm to the edit when donor imputation was required. The farm characteristics used to define similarity between a recipient record and its donor record were determined dynamically by the edit logic. Euclidean distance was used for similarity computations, with each contributing similarity characteristic scaled appropriately. The most similar farm based on this criterion (the "nearest neighbor") was identified and returned to the edit for use as a donor. The calculated distance between the centroids of the principal counties of production of the donor and recipient was always included as one of the measures of similarity.

To provide donors to the automated edit, a pool of successfully edited records was maintained for each section of the report form. These donor pools began with 2012 census data, reconfigured to emulate 2017 data and then edited using 2017 logic. Data from the 2015 Census Content Test were similarly remapped and edited before being added to the original donor pools. As 2017 records were successfully processed, they were added to the donor pools, which maintained the most recent data for each farm. Donor pools were updated approximately every other week, as determined by edit processing schedules. After several updates, all initial data records were dropped, leaving only 2017 records in the donor pools. After each update, donor pool records were grouped into strata containing farms in the same State of similar type and size, using a data-driven algorithm to define strata. Certain American Indian farms were treated as a separate group, effectively having their own donor pool.

In response to each donor request issued by the edit, a dedicated system process would search the appropriate stratum and respond with the most similar donor, while giving preference to more recent donors. In relatively rare instances where it was unable to provide a donor, the donor selection process issued an appropriate failure message to the edit. Imputation failures occurred for several different reasons. The requirement that an imputed value be positive could have ruled out all available donors, as could have the necessity for the donor record to satisfy a particular constraint – say, that the donor record has cattle, but no milk cows. In general, an imputation failure occurred if there were no satisfactory donors in the same profile as the report being edited. Records with imputation failures were either held until more records were available in the donor pool or referred to an analyst. In addition, when such a failure occurred in finding a donor for expenditure data, donor pool averages were provided in lieu of an individual donor, wherever possible. This "failover" utility was first introduced for the 2012 census imputation process, and significantly reduced the number of imputation failures among the expenditure and labor variables. During the early stages of editing, records requiring imputation for production (and hence yields) of field crops or hay, land values, or certain expenditure variables, were set aside or "parked." These records were edited when the donor pools contained only 2017 records, ensuring that 2017 data were used in the imputations for the variables.

After receiving a donor's data, the edit substituted the values into the edited record. In many cases, the donor record's data value was scaled using another data field specified in the edit logic. In such cases, the size of the auxiliary field's value in the edited record, relative to its value in the donor record, was used to appropriately scale the donor record's value for the field to be imputed. The imputed data were then validated by the same edit logic to which reported data were subject. Since imputation was conducted independently for each occurrence, reports requiring multiple imputations may have drawn from multiple donors.

Substantial changes were introduced to the Personal Characteristics section of the form in 2017. Information on an additional (fourth) producer was collected, and several new questions were added for each producer – specifically, whether or not the person was considered a "principal producer," whether the person was a spouse of a principal producer, and whether the person was involved in any of five types of decisions with respect to the operation. These changes necessitated a new imputation process for records reporting three or more persons as producers. Records with one or two persons reported as producers had these data edited and imputed using the decision logic table edit and donor pool imputation process. Records with three or more persons reported as producers, and for which it was determined that these data were inconsistent or missing, had these data imputed using a fully conditional specification method. During the edit for records reporting three or more producers, the items needing imputation were marked, and the record was flagged. Periodically the data for these records (both the items needing to be imputed and the other variables needed by the model) were pulled and run through the imputation program. The resulting imputed values were loaded back to the records, and the records were made available for review. This process was conducted 19 times for the CML, and 6 times for the NML, during census production editing.

Data Analysis

The complex edit ensured the full internal consistency of the record. Successfully completing the edit did not provide insight as to whether the report was

reasonable compared to other reports in the county. Analysts were provided an additional set of tools, in the form of listings and graphs, to review record-level data across farms. These examinations revealed extreme outliers, large and small, or unique data distribution patterns that were possibly a result of reporting, recording, or handling errors. Potential problems were investigated and, when necessary, corrections were made and the record interactively edited again.

When NASS summarizes data from the census of agriculture, each individual report is typically assigned to a single "principal" county. The principal county is the county in which the majority of an operation's agricultural products are produced, as reported by the producer. For large operations that have significant production in multiple counties, their reports may be broken up into multiple source counties to more accurately summarize the data. Similarly, for large farms operating in more than one State, separate report forms are completed by State in order to assign the proper portion of the farm's total agricultural production to each State in which the farm operates.

ACCOUNTING FOR UNDERCOVERAGE, NONRESPONSE, AND MISCLASSIFICATION

Although much effort was expended making the CML as complete as possible, the CML did not include all U.S. farms, resulting in list undercoverage. Some farm producers who were on the CML did not respond to the census, despite numerous attempts to contact them. In addition, although each operation was classified as a farm or a nonfarm based on the responses to the census report form, some were misclassified; that is, some nonfarms were classified as farms and some farms were classified as nonfarms. NASS's goal was to produce agricultural census totals for publication at the county level that were fully adjusted for list undercoverage, nonresponse, and misclassification.

In 2012 NASS used capture-recapture methodology to adjust for undercoverage, nonresponse, and misclassification. This same methodology was implemented for the 2017 Census of Agriculture. To implement capture-recapture methods, two independent surveys were required. The 2017 Census of Agriculture (based on the CML) and the 2017 JAS (based on the area frame) were those two surveys. Historically, NASS has been careful to maintain the independence of these two surveys.

A second assumption was that the proportion of JAS farms with a given set of characteristics captured by the census was equal to the proportion of U.S. farms with those same characteristics captured by the census.

For a farm to be identified as a farm, and thus captured by the census, it must be on the CML, respond to the census report form and, based on the census response, be classified as a farm. Only those nonrespondents included in the nonresponse sample had an opportunity to be captured and had a probability π_S of being included in the sample; respondents prior to drawing the nonresponse sample had $\pi_S = 1$. Thus, the capture probability π_C is of interest:

$$\pi_C = \pi(\text{CML, Responded, Farm on Census}|\text{Farm})\ \pi_S$$

Two types of classification error can occur. First, a farm can be misclassified as a nonfarm. This type of misclassification is accounted for in determining the probability of capture π_C. The second type of classification error results when a response to the census is classified as a farm operation when it does not meet the definition of a farm. That is, some farms on the CML may be misclassified from their census report response and may be nonfarms. To account for the misclassification of nonfarms as farms, the probability of a farm on the census being classified correctly must be estimated; that is,

$$\pi_{CCFC} = \pi(\text{Farm} \mid \text{Farm on Census})$$

where *CCFC* represents Correct Census Farm Classification. To adjust for undercoverage, nonresponse, and misclassification, each CML record classified as a farm based on its response to the census report form was given a weight of the ratio of the estimated probability of correct classification of a farm on the census and the estimated probability of capture ($\hat{\pi}_{CCFC}/\hat{\pi}_C$ where the hat symbol ($\hat{}$) denotes an estimate). To estimate the number of farms with a given set of characteristics, the weights of CML records responding as farms on the census and having that set of characteristics were summed. This

estimator is referred to as the capture-recapture estimator (*CR*):

$$CR = \sum_{i \in F} \frac{\hat{\pi}_{CCFC,i}}{\hat{\pi}_{C,i}}$$

where *F* is the set of all CML records classified as farms based on their responses to the census report form.

To estimate the capture and correct census farm classification probabilities, a matched dataset consisting of JAS records and census records was created. Records in the 2017 JAS sample were matched to the 2017 census using probabilistic record linkage. The CML records that matched with JAS tracts represent the Census Sample.

Note: The Census Sample is a subset of the CML records and includes only those records matching a JAS tract. Both agricultural and non-agricultural tracts were included in the matched dataset.

Resolving Farm Status

The farm status based on census responses to either the CML or NML census data collection and the JAS agreed in most cases; these records are referred to as having resolved farm status. However, in other cases, a record was identified as a farm (nonfarm) on the JAS and as a nonfarm (farm) by the census through either the CML or the NML. Such records are said to have conflicting or unresolved farm status. An operation identified as a farm is referred to as in-scope; an operation identified as a nonfarm is referred to as out-of-scope. From the set of matched records, two groups with conflicting farm status were identified: 1) in-scope JAS records that were out-of-scope on the census and 2) census in-scope and JAS out-of-scope records. The records with conflicting farm status were sent to NASS regional field offices for review. In each case, efforts were made to determine whether (1) the status had changed between June and December when the census was conducted, (2) the JAS farm status was correct, (3) the census farm status was correct, (4) the records were incorrectly matched, or (5) the farm status could not be resolved. Not all of the records with conflicting farm status could be resolved. In 2017, 8.1 percent of the records in the Census Sample had unresolved farm status.

The probability an operation is a farm was estimated for the records with unresolved farm status. Using the 2017 matched dataset, a logistic model of the probability an operation is a farm based on the records with resolved farm status was developed; that is, the operations where the farm (or nonfarm) status agreed between the JAS and the census were used to develop a missing data model, which was then used to resolve farm status. The final missing data model was used to impute the probability that each of the agricultural operations with unresolved farm status is a farm. For the resolved farms and nonfarms, the probability of the operation being a farm was 1 and 0, respectively. Five-fold cross-validation was used to develop and to compare competing models. The accuracy of the model was thereby not overstated due to fitting and evaluating the model on the same set of data. To ensure that each of the cross-validation samples covered the U.S., the five cross-validation samples of JAS segments were drawn within State-stratum combinations. Characteristics of the JAS tracts were considered as potential covariates in the model. Because limited information is available for JAS nonfarm tracts, other covariates considered included county-level socio-demographic variables from the most recent U.S. population census, segment-level data from the Cropland Data Layer, the county-level rural-urban code, state-level response rates, an indicator for records that are thought to be out-of-business, and an indicator for records in the national nonresponse sample. The sample weight associated with each JAS tract was multiplied by the probability of being a farm. This adjusted weight was used in all subsequent modeling.

Capture Probabilities

Recall that, for a farm to be identified as a farm, and thus captured, by the census, it must be on the CML, respond to the census report form and, based on the census response, be classified as a farm. These adjustments are dependent. Further, those nonrespondents at the time the nonresponse sample was drawn had a known probability π_S of being included in the sample; respondents before the sample was drawn had $\pi_S = 1$. Therefore, the probability of capture π_C may be written as

$\pi_C = \pi$(CML, Responded, Farm on Census|Farm) π_S = π(CML|Farm)π(Responded|CML, Farm)π(Farm on Census|CML, Responded, Farm) π_S

The probability of being included in the sample π_S is known for all responding farms. The other terms in the probability of capturing a farm depend on the characteristics of the farm. Using five-fold cross-validation, three logistic models were developed based on the matched dataset. The first model estimated the probability of a farm being on the CML. The second model estimated the probability that a farm on the CML responded to the census report form. The final model estimated the probability that a farm that was on the CML and responded to the census was identified as a farm based on its response. The probability that a farm is captured by the census of agriculture is then the product of the three conditional probabilities that a farm is on the CML, responds, and is identified as a farm.

Note 1: Responses were required for Must cases. These operations were only excluded in modeling the probability of a farm responding given that it was on the CML.

Note 2: Because Alaska is not included in the JAS and thus has no area frame, the Alaskan agricultural operations were not included in the capture-recapture process. No adjustments were made for undercoverage or misclassification. To account for nonresponse, the CML records were divided into three groups: (1) the Must records, (2) the Criteria Records, and (3) the remaining CML records. The must records received a weight of one, thereby receiving no adjustment for nonresponse. The probability of response for each of the other two groups was the proportion of responders within the group. Each record within the group was then given a weight equal to the reciprocal of the probability of response.

Misclassification

An operation is misclassified if: (1) it meets the definition of a farm, but is classified as a nonfarm on the census or (2) it does not meet the definition of a farm, but is classified as a farm on the census. The first type of misclassification is accounted for when modeling the probability of capture. An adjustment is still needed for the misclassification of nonfarms as farms. As with farm status and capture, the probability of this misclassification depends on an operation's characteristics. Thus, a final logistic model was developed. Given that an operation was classified as a farm on the CML, the probability of its being a farm was modeled based on its characteristics. Five-fold cross-validation was used to ensure that the model was not over-fitted.

CALIBRATION

Each operation identified as being in-scope on the CML was given a weight equal to the probability of misclassification divided by the probability of capture. This weight accounted for undercoverage, nonresponse, both types of misclassification, and the nonresponse sample.

The record weighting processes were initially applied at the State level to produce adjusted estimates of farm numbers and land in farms for 63 different categories of 8 characteristics of the farm operation or the farm producer -- value of agricultural sales (9); age (2); female; race (3); Hispanic origin of principal farm producer; 4 sales categories for each of 10 major commodities (40); and farm type groups (7). The State-level number of farms and land in farms were two additional adjusted estimates, resulting in 65 categories. To reduce the intercensal variation at the State level, the State targets were smoothed by averaging the 2017 estimates from capture-recapture and the published 2012 State estimates with the restrictions that the smoothed targets were within two standard errors of the capture-recapture estimates. The smoothed State targets were rescaled so that they summed to the national capture-recapture estimates.

These State estimates were general purpose in that they did not provide any control over expected levels of commodity production of the individual farm operation. As a result of this limitation, the procedures could have over-adjusted or under-adjusted for commodity production. To address this, a second set of variables, known as commodity targets, was added to the calibration algorithm. These targets were commodity totals from administrative sources or from NASS surveys of nonfarm populations (e.g. USDA Farm Service Agency program data, Agricultural Marketing Service market orders, livestock slaughter data, cotton ginning data). The introduction of these

commodity coverage targets strengthened the overall adjustment procedure by ensuring that major commodity totals remained within reasonable bounds of established benchmarks.

Each State was calibrated separately. The calibration algorithm addressed commodity coverage. The algorithm was controlled by the 65 State farm operation coverage targets and the State commodity coverage targets. Because calibration targets are estimates subject to uncertainty, NASS allowed some tolerance in the determination of the adjusted weights. Rather than forcing the total for each calibration variable computed using the adjusted weights to equal a specific amount, NASS allowed the estimated total to fall within a tolerance range.

Tolerance ranges for the farm operation coverage targets were determined differently from the commodity targets. The tolerance range for the 65 State farm operation coverage targets was the estimated smoothed State total for the variable plus or minus one standard error of the capture-recapture estimate. This choice limited the cumulative deviation from the estimated total for a variable when State totals were summed to a U.S. total. Commodity coverage targets with acceptable ranges were established based on the administrative source for each State. Ranges were not necessarily symmetric around the target value.

To ensure that all subdomains for which NASS publishes summed to their grand total, integer weights were produced by a discrete calibration algorithm. This eliminated the need for rounding individual cell values and ensured that marginal totals always added correctly to the grand total. If a weight was initially not in the interval [1,6], it was trimmed so that in was in that interval. That is, adjusted weights less than 1 were set to 1, and those greater than 6 were set to 6. The remaining non-integer weights were then rounded sequentially to reduce the distance of the estimated totals from the targets.

Calibration adjustments began with the computation of a priority index for each record. The priority index was the absolute value of the gradient of the relative error associated with increasing or decreasing a record's weight by one. The record with the highest priority index was then selected as a candidate to increase or decrease its weight by one to reduce the cumulative distance from the targets as measured by the relative error. If the new value produced an improvement and satisfied the range restrictions, the weight was updated and new priorities were assigned; otherwise, the record with the next highest priority index was processed. This process was iteratively performed until convergence was attained. Because census data collection was assumed to be complete for very large and unique farms, their weights were controlled to 1 during the calibration adjustment process. For all other farms, the final census record weights were forced to be an integer number in the interval [1, 6]. The calibration process considered all targets simultaneously through the priority index. Although calibration was seldom able to adjust weights so that all State targets were met, all targets were brought collectively as close to the targets as possible.

The proportions of selected census data items that were due to coverage, response, and classification adjustments are displayed in Tables A and C.

DISCLOSURE REVIEW

After tabulation and review of the aggregates, a comprehensive disclosure review was conducted. NASS is obligated to withhold, under Title 7, U.S. Code, any total that would reveal an individual's information or allow it to be closely estimated by the public. Farm counts are not considered sensitive and are not subject to disclosure controls. Cell suppression was used to protect the cells that were determined to be sensitive to a disclosure of information.

Based on agency standards, data cells were determined to be sensitive to a disclosure of information if they failed either of two rules. The threshold rule failed if the data cell contained less than three operations. For example, if only one farmer produced turkeys in a county, NASS could not publish the county total for turkey inventory without disclosing that individual's information. The dominance rule failed if the distribution of the data within the cell allowed a data user to estimate any respondent's data too closely. For example, if there are many farmers producing turkeys in a county and some of them were large enough to dominate the cell total, NASS could not publish the county total for turkey inventory without risking disclosing an individual respondent's data. In both of these

situations, the data were suppressed and a "(D)" was placed in the cell in the census publication table. These data cells are referred to as primary suppressions.

Since most items were summed to marginal totals, primary suppressions within these summation relationships were protected by ensuring that there were additional suppressions within the linear relationship that provided adequate protection for the primary. A detailed computer routine selected additional data cells for suppression to ensure all primary suppressions were properly protected. These data cells are referred to as complementary suppressions. These cells are not themselves sensitive to a disclosure of information but were suppressed to protect other primary suppressions. A "(D)" was also placed in the cell of the census publication table to indicate a complementary suppression. A data user cannot determine whether a cell with a (D) represents a primary or a complementary suppression.

Regional field office analysts reviewed all complementary suppressions to ensure no cells had been withheld that were vital to the data users. In instances where complementary suppressions were deemed critically important to a State or county, analysts requested an override and a different complementary cell was chosen.

CENSUS QUALITY

The purpose of the census of agriculture is to account for "any place from which $1,000 or more of agricultural products were produced and sold, or normally would have been sold, during the census year." To accomplish this, NASS develops a CML that contains identifying information for operations that have an indication of meeting the census definition, develops procedures to collect agricultural information from those records, establishes criteria for analyst review of the data, creates computer routines to correct or complete the requested information, and provides census estimates of the characteristics of farms and farm producers with associated measures of uncertainty.

It is not likely that either the CML includes all operations that meet the definition of a farm or that all those that do meet the definition of a farm respond to the census inquiry. The goal is to publish data with a high level of quality. The quality of a census may be measured in many ways. One of the first indicators used is a measure of the response to the census data collection as it has generally been thought that a high response rate indicates more complete coverage of the population of interest. This is a valid assumption if the enumeration list, the CML here, has complete coverage of the population of interest. In the case of the census of agriculture, the definition requiring advance knowledge of sales makes achieving a high level of coverage difficult. To ensure that the census of agriculture is as complete as possible, records are included that might not meet the census definition of a farm – in fact, almost 50 percent more records than the anticipated number of qualifying farm operations were included in the 2017 CML. A second indicator of quality then is the coverage of the farm population by the CML. Other indicators of quality relate to the accuracy and completeness of the data, and the validity of the procedures used in processing the data.

In some cases, NASS was able to produce measures of quality – such as the response rate to the data collection, the coverage of the census mail list, and the variability of the final adjusted estimates. In other cases, measures were not produced but descriptions of procedures that NASS used to reduce errors from the procedures were subsequently provided.

Census Response Rate

The response rate is one indicator of the quality of a data collection. It is generally assumed that if a response rate is close to a full participation level of 100 percent, the potential for nonresponse bias is small, although this has been questioned in the literature. The response rate for the 2017 Census of Agriculture CML was 71.8 percent, as compared with the 2012 Census of Agriculture's response rate of 74.6 percent and 78.2 percent for the 2007 Census of Agriculture.

The 2017 Census of Agriculture's response rate used the fourth response rate formula (RR4) from the American Association of Public Opinion Research's Response Rate Standard Definitions manual:

$$RR4 = \frac{C_{adj}}{C_{adj} + R + NC + O + Replicated + e(U)}(100)$$

where

C_{adj} = number of fully and partially completed records, excluding replicated records
R = number of explicit refusals
NC = number of non-contacted operations known to be eligible
O = number of other types of nonrespondents
Replicated = number of replicated records
U = number of operations of unknown eligibility
$e(U)$ = estimated number of operations of unknown eligibility assumed to be eligible

Records were classified into the above variables based on the combination of their active status (AS) codes, in-scope status, and replication status. Active status refers to the eligibility status of records for selection on the CML. All replicated records were considered to be a form of nonresponse and were classified into other nonrespondents; in-scope status was considered immaterial.

Certain active status classifications indicated records of unknown agricultural status. These classifications included records to be removed from the CML but had data from outside sources indicating agricultural activity, new records from outside data sources, nonrespondents and refusals to the NACS, records for regional office handling only, and records with Farm Service Agency or Conservation Reserve Program data on operations that are not owned by the principal producer. These records were stratified (grouped) based on their probabilities of being in-scope had they responded. The estimated number of in-scope nonrespondents was calculated for the *h*th stratum (group) by the following formula:

$$e(U_h) = \left(\frac{C_{in-scope,h}}{C_h} \right) U_h$$

where

$e(U_h)$ = estimated number of operations of unknown eligibility assumed to be eligible in the *h*th group
$C_{in\text{-}scope,h}$ = the number of completed and in-scope census records in the *h*th group
C_h = the number of completed census records in the *h*th group
U_h = number of operations of unknown eligibility in the *h*th group

Census Coverage

As a side-product of the statistical adjustment used to account for undercoverage, nonresponse of farms on the CML, and misclassification of responses to the census, the proportion of the adjustments due to each of those factors can be derived. The percentages of final census estimates due to adjustments for undercoverage, nonresponse, and misclassification as well as the total percent adjustment for selected items are displayed in Tables A and C.

MEASURED ERRORS IN THE CENSUS PROCESS

Although the census of agriculture does not inherently rely on a sample, NASS used a national nonresponse sample as part of its follow-up efforts in 2017. In addition to the uncertainty introduced by the nonresponse sample, NASS uses statistical procedures in compiling the CML, in its data collection procedures, in data editing and processing, and in compiling the final data. Additionally, it uses statistical procedures to both measure errors in the various processes and in making adjustments for those errors in the final data. One example is the statistical process used to account for undercoverage, nonresponse of farms on the CML, and misclassification of responses to the census. The basis of the undercoverage adjustment is the capture-recapture procedure that uses the area sample enumeration from the JAS. The largest contributors to error in the census estimates are due to the adjustments for nonresponse, undercoverage, misclassification, calibration, and integerization.

Variability in Census Estimates due to Statistical Adjustment

In conducting the 2017 Census of Agriculture, efforts were initiated to measure error associated with the adjustments for farm operations that were not on the CML, for farm operations that were on the CML but did not respond to the census report form, and for farms and nonfarms that were misclassified as nonfarms and farms, respectively, for calibration. These error measurements were developed from the standard error of the estimates at the national, State, and county levels and were expressed as coefficients of variation (CVs) at the national and State levels and

as generalized coefficients of variation (GCVs) at the county levels.

The standard error of an estimate is an estimate of the standard deviation of the sampling distribution of the estimator. Because Alaska was modeled separately from the other States, the variances of a national-level data item for this State was computed separately and added to the variance of that data item for the rest of the U.S. The standard error was then the square root of the total variance. In each case, standard errors were computed using an approach based on a combination of group jackknife and bootstrap methodologies. To conduct the jackknifing, k = 10 mutually exclusive and exhaustive groups of JAS segments were formed. The groups were selected using a stratified random design so that each group reflected the survey design, including State and agricultural strata within a State. The weight of record i in jackknife group j is $CR_i^{(j)}$ for j = 1, 2, …, k. Based on these weights, a group jackknife estimator to estimate the variance would account for the uncertainty associated with modeling the capture-recapture probabilities. To account for the additional uncertainty due to calibration, the weights within each jackknife group were transformed through bootstrap simulation; these transformed weights are called calibration-adjusted-jackknife weights. The full dataset, which is composed of the records of all responding farms on the CML, is calibrated as described in the Calibration section, and the final calibration-adjusted weight of record i is denoted by $\hat{w}_i$. For each record i in jackknife group k, the calibration-adjusted-jackknife weights of that record can be approximated as $w_i^{(j)}=a_i^{(j)}CR_i^{(j)}$ where $a_i^{(j)} \sim N(1,(\hat{w}_i-1)/\hat{w}_i)$. The bootstrap process simulated the value of the adjustment $a_i^{(j)}$ for each record on the CML to obtain the calibration-adjusted-jackknife weights. For a given data item, such as the number of farms, the estimate $T^{(j)}$ was computed at the specified geographical level, such as nation, State, or county, using the (k – 1) groups remaining after deleting the calibration-adjusted jackknife group j. Estimates of the variance and standard error associated with the estimator T_i are then, respectively,

$$\sigma_i^2 = \frac{k-1}{k}\sum_{j=1}^{k}\left(T_i^{(j)} - \sum_{l=1}^{k}\frac{T_i^{(l)}}{k}\right)^2; \quad SE\left(T_i\right) = \sqrt{\sigma_i^2}$$

Increasing k improves the estimate of the variance but, as k increases, the observations become too sparse to reflect the survey design and to provide countrywide coverage. Ten (10) calibration-adjusted jackknife groups were used to provide standard errors for 2017 State and national estimates. For the estimate of the number of farms with a given set of characteristics, only the CML records with those characteristics were used to obtain the overall estimate as well as the estimates from each calibration-adjusted jackknife group.

Note that the calibrated jackknife groups were only constructed once, and different subsets of the records were used to compute estimates and standard errors for the data items.

The CV is a measure of the relative amount of error associated with the sample estimate:

$$\mathrm{CV}_i = \frac{SE\left(T_i\right)}{T_i}100\%$$

where $SE(T_i)$ is the standard error of the capture-recapture estimate for data item i. This relative measure allows the reliability of a range of estimates to be compared. For example, the standard error is often larger for large population estimates than for small population estimates, but the large population estimates may have a smaller CV, indicating a more reliable estimate. For county-level estimates, a generalized coefficient of variation (GCV) was determined for each estimate within a State. A generalized variance function relates a function of the variance of an estimator to a function of the estimator. Within a State, the standard error of an estimate for a data item was often found to be linearly related to the estimate of that item with an intercept of zero. Based on this modeled relationship, the GCV is the slope of the line relating the standard error to the estimate, multiplied times 100 to represent the GCV as a percentage.

The standard error is the product of the CV (or GCV for county estimates) and the estimate divided by 100. As an example, if the GCV for a State is 25 percent and a county's estimate is 4, then the standard error is 25(4)/100 = 1. The standard error of an estimated data item from the census provides a measure of the error variation in the value of that estimated data item based on the possible outcomes of the census collection,

including variants as to who was on the CML, who returned a census form, who was misclassified either as a farm or as a nonfarm, and the uncertainty associated with calibration and integerization. With 95 percent confidence, an estimate is within two standard errors of the true value being estimated. For this example, with 95 percent confidence, the estimate of 4 is within 2(1) = 2 of the true county value.

Table B presents the fully adjusted estimates with the coefficient of variation for selected items.

NONMEASURED ERRORS IN THE CENSUS PROCESS

As noted in the previous section, sampling errors can be introduced from the coverage, nonresponse and misclassification adjustment procedures. This error is measureable. However, nonsampling errors are imbedded in the census process that cannot be directly measured as part of the design of the census but must be contained to ensure an accurate count. Extensive efforts were made to compile a complete and accurate mail list for the census, to elicit response to the census, to design an understandable report form with clear instructions, to minimize processing errors through the use of quality control measures, to reduce matching error associated with the capture-recapture estimation process, and to minimize error associated with identification of a respondent as a farm operation (referred to as classification error). The weight adjustment and tabulation processes recognize the presence of nonsampling errors; however, it is assumed that these errors are small and that, in total, the net effect is zero. In other words, the positive errors cancel the negative errors.

Respondent and Enumerator Error

Incorrect or incomplete responses to the census report form or to the questions posed by an enumerator can introduce error into the census data. Steps were taken in the design and execution of the census of agriculture to reduce errors from respondent reporting. Poor instructions and ambiguous definitions lead to misreporting. Respondents may not remember accurately, may estimate responses, or may record an item in the wrong cell. To reduce reporting and recording errors, the report form was tested prior to the census using industry accepted cognitive testing procedures. Detailed instructions for completing the report form were provided to each respondent. Questions were phrased as clearly as possible based on previous tests of the report form. Computer-assisted telephone interviewing software included immediate integrity checks of recorded responses so suspect data could be verified or corrected. In addition, each respondent's answers were checked for completeness and consistency by the complex edit and imputation system.

Processing Error

Processing of each census report form was another potential source of nonsampling error. All mail returns that included multiple reports, respondent remarks, or that were marked out of business and report forms with no reported data were sent to an analyst for verification and appropriate action. Integrity checks were performed by the imaging system and data transfer functions. Standard quality control procedures were in place that required that randomly selected batches of data keyed from image be re-entered by a different operator to verify the work and evaluate key entry operators. All systems and programs were thoroughly tested before going on-line and were monitored throughout the processing period.

Developing accurate processing methods is complicated by the complex structure of agriculture. Among the complexities are the many places to be included, the variety of arrangements under which farms are operated, the continuing changes in the relationship of producers to the farm operated, the expiration of leases and the initiation or renewal of leases, the problem of obtaining a complete list of agriculture operations, the difficulty of contacting and identifying some types of contractor/contractee relationships, the producer's absence from the farm during the data collection period, and the producer's opinion that part or all of the operation does not qualify and should not be included in the census. During data collection and processing of the census, all operations underwent a number of quality control checks to ensure results were as accurate as possible.

Item Nonresponse

All item nonresponse actions provide another opportunity to introduce measurement errors. Regardless of whether it was previously reported data, administrative data, the nearest neighbor algorithm,

the fully conditional specification method, or manually imputed by an analyst, some risk exists that the imputed value does not equal the actual value. Previously reported and administrative data were used only when they related to the census reference period. A new nearest neighbor was randomly selected for each incident to eliminate the chance of a consistent bias.

Record Matching Error

The process of building and expanding the CML involves finding new list sources and checking for names not on the list. An automated processing system compared each new name to the existing CML names and "linked" like records for the purpose of preventing duplication. New names with strong links to a CML name were discarded and those with no links were added as potential farms. Names with weak links, possible matches, were reviewed by staff to determine whether the new name should be added. Despite this thorough review, some new names may have been erroneously added or deleted. Additions could contribute to duplication (overcoverage) whereas deletions could contribute to undercoverage. As a result, some names received more than one report form, and some farm producers did not receive a report form. Respondents were instructed to complete one form and return all forms so the duplication could be removed.

Another chance for error came when comparing June Area Survey tract producer names to the CML. Area producers whose names were not found on the CML were part of the measure of list incompleteness, or NML. Mistakes in determining overlap status resulted in overcounts (including a tract whose producer was on the CML) or undercounts (excluding a tract whose producer was not on the CML). All tracts determined to not be on the list were triple checked to eliminate, or at least minimize, any error. NML tract producers were mailed a report form printed in a different color. In order to attempt to identify duplication, all respondents who received multiple report forms were instructed to complete the CML version and return all forms so duplication could be removed.

Records in the 2017 JAS were matched to the 2017 census using probabilistic record linkage. The records of operations with differing farm status were sent out to be reviewed by NASS regional field offices. If farm status could not be resolved, the probability of an operation being a farm was imputed using a missing data model. The uncertainty associated with this estimate, with the exception of model uncertainty, was accounted for, but errors not found through this process were not.

Table A. **Summary of State Coverage, Nonresponse, and Misclassification Adjustments: 2017**

[For meaning of abbreviations and symbols, see introductory text.]

Item	Total	Standard error	Adjustment as percent of total	Percent of total adjustment from coverage	Percent of total adjustment from nonresponse	Percent of total adjustment from misclassification
Farms ..... number	248,416	8,706	42.1	17.8	14.5	9.8
Land in farms ..... acres	127,036,184	3,219,092	23.0	5.8	8.3	8.9
Farms by size:						
1 to 9 acres ..... farms	27,889	3,870	63.1	25.8	21.2	16.1
acres	148,099	20,268	63.1	25.9	19.6	17.6
10 to 49 acres ..... farms	81,616	6,260	47.2	21.7	15.3	10.3
acres	1,975,872	180,221	46.2	20.4	14.5	11.3
50 to 69 acres ..... farms	17,974	708	40.9	17.9	15.3	7.7
acres	1,038,695	40,280	40.9	17.9	15.3	7.7
70 to 99 acres ..... farms	17,844	1,013	38.7	15.3	14.6	8.8
acres	1,479,491	76,376	38.7	15.2	14.5	8.9
100 to 139 acres ..... farms	18,310	990	38.2	13.7	14.2	10.3
acres	2,114,726	118,842	38.2	13.7	14.2	10.3
140 to 179 acres ..... farms	12,887	778	36.0	13.6	11.1	11.3
acres	2,033,823	120,561	35.9	13.6	11.0	11.3
180 to 219 acres ..... farms	9,235	478	34.4	16.3	12.5	5.6
acres	1,831,619	95,242	34.4	16.2	12.6	5.6
220 to 259 acres ..... farms	6,281	191	31.3	15.6	10.2	5.5
acres	1,496,313	45,152	31.3	15.6	10.2	5.5
260 to 499 acres ..... farms	20,856	881	32.1	13.5	11.8	6.8
acres	7,436,129	310,476	32.2	13.4	11.8	7.0
500 to 999 acres ..... farms	15,024	578	32.2	15.5	11.1	5.5
acres	10,422,280	392,869	32.1	15.2	11.3	5.6
1,000 to 1,999 acres ..... farms	9,463	762	30.8	7.5	12.2	11.1
acres	13,049,936	1,045,301	30.8	7.3	12.3	11.2
2,000 acres or more ..... farms	11,037	230	27.2	4.6	17.5	5.1
acres	84,009,201	3,294,090	17.6	2.4	6.3	8.8
Irrigated land use:						
Harvested cropland ..... farms	13,925	838	36.4	14.6	15.3	6.6
acres	4,054,569	165,541	27.4	3.3	20.6	3.5
Pastureland and other land ..... farms	5,088	555	49.0	21.5	16.9	10.5
acres	308,776	27,818	30.6	10.6	13.3	6.6
Market value of agricultural products sold (see text) $1,000	24,924,041	417,773	14.1	3.9	6.1	4.1
Farms by value of sales:						
Less than $1,000 (see text) ..... farms	89,454	6,782	55.3	23.9	17.3	14.1
$1,000	13,872	1,621	60.6	25.9	19.3	15.4
$1,000 to $2,499 ..... farms	31,921	1,595	46.1	21.4	16.4	8.3
$1,000	52,648	2,233	46.0	21.4	16.2	8.3
$2,500 to $4,999 ..... farms	28,876	976	39.0	17.9	13.7	7.3
$1,000	102,712	3,249	38.7	17.8	13.6	7.3
$5,000 to $9,999 ..... farms	30,375	993	37.2	16.8	12.8	7.6
$1,000	213,935	6,892	37.2	16.8	12.8	7.6
$10,000 to $19,999 ..... farms	22,331	569	25.5	9.2	10.5	5.7
$1,000	313,118	8,927	25.6	9.3	10.5	5.8
$20,000 to $24,999 ..... farms	6,163	245	26.3	10.6	9.6	6.1
$1,000	135,605	5,254	26.4	10.7	9.6	6.1
$25,000 to $39,999 ..... farms	10,508	390	26.1	8.2	12.2	5.8
$1,000	327,566	12,797	26.0	8.2	12.1	5.7
$40,000 to $49,999 ..... farms	3,941	238	25.3	7.9	11.7	5.6
$1,000	174,203	10,624	25.2	8.0	11.6	5.6
$50,000 to $99,999 ..... farms	8,536	290	25.4	6.9	12.7	5.7
$1,000	589,795	20,915	25.5	6.9	12.8	5.8
$100,000 to $249,999 ..... farms	6,708	376	29.4	3.8	17.4	8.1
$1,000	1,041,437	56,884	29.5	3.7	17.9	7.9
$250,000 to $499,999 ..... farms	3,493	223	32.3	3.1	22.5	6.8
$1,000	1,258,670	75,975	33.8	3.2	23.8	6.9
$500,000 to $999,999 ..... farms	2,709	175	31.8	2.4	25.9	3.4
$1,000	1,958,453	123,999	33.3	2.6	27.0	3.7
$1,000,000 or more ..... farms	3,401	80	20.5	3.4	12.9	4.2
$1,000	18,742,027	309,952	8.3	2.8	2.4	3.0
Legal status for tax purposes (see text):						
Family or individual ..... farms	223,284	7,690	42.7	18.4	14.5	9.8
acres	79,294,606	2,013,627	26.1	7.7	10.4	8.1
Partnership ..... farms	14,211	1,880	35.1	12.0	13.0	10.2
acres	30,510,113	1,079,403	17.9	3.4	5.7	8.8
Corporation:						
Family held ..... farms	6,454	519	37.3	12.7	15.0	9.6
acres	12,393,859	703,107	17.3	2.3	4.7	10.3
Other than family held ..... farms	813	130	38.6	14.8	15.0	8.7
acres	1,849,237	206,092	9.3	1.1	2.1	6.0
Other - estate or trust, prison farm, grazing association, American Indian Reservation, etc ..... farms	3,654	515	40.6	15.1	16.6	8.9
acres	2,988,369	185,360	22.7	6.4	7.2	9.0
Tenure:						
Full owners ..... farms	184,279	7,237	44.0	19.2	14.1	10.6
acres	50,128,508	1,399,983	25.7	7.6	7.0	11.0
Part owners ..... farms	50,564	1,515	35.0	12.6	15.1	7.3
acres	61,029,115	1,749,568	21.6	4.1	9.3	8.3
Tenants ..... farms	13,573	1,513	43.5	16.4	20.9	6.2
acres	15,878,561	615,399	19.5	5.4	10.3	3.8
All principal producer characteristics by [1]-						
Sex of operator:						
Male ..... farms	215,390	7,990	40.9	17.2	14.7	9.0
acres	117,695,088	2,974,165	22.6	5.4	8.4	8.8
Female ..... farms	101,932	5,263	46.7	18.5	16.0	12.2
acres	35,429,107	1,234,654	24.8	6.9	8.5	9.4
Primary occupation:						
Farming ..... farms	128,075	3,153	38.5	15.4	13.1	10.1
Other ..... farms	206,388	15,869	45.4	17.6	16.9	11.0

See footnote(s) at end of table.

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Table A. **Summary of State Coverage, Nonresponse, and Misclassification Adjustments: 2017** (continued)

[For meaning of abbreviations and symbols, see introductory text.]

Item		Total	Standard error	Adjustment as percent of total	Percent of total adjustment from coverage	Percent of total adjustment from nonresponse	Percent of total adjustment from misclassification
All principal producer characteristics by [1]- - Con.							
Hispanic, Latino, or Spanish origin (see text)	farms	28,173	3,909	59.3	23.5	23.9	11.9
	acres	7,089,991	309,004	35.1	12.4	13.9	8.8
Race:							
American Indian or Alaska Native	farms	2,208	556	54.7	17.4	23.8	13.5
	acres	599,509	222,948	42.1	12.4	16.6	13.0
Asian	farms	1,073	210	50.0	17.2	20.7	12.1
	acres	129,869	27,503	41.5	12.2	19.8	9.6
Black or African American	farms	8,011	2,478	66.0	13.9	31.5	20.6
	acres	946,751	117,171	64.9	11.7	34.5	18.7
Native Hawaiian or Other Pacific Islander	farms	128	104	58.6	25.0	17.0	16.6
	acres	15,473	8,177	24.8	10.5	7.0	7.3
White	farms	237,246	8,872	41.2	17.8	13.9	9.5
	acres	125,261,769	3,154,708	22.6	5.7	8.1	8.8
More than one race reported	farms	2,578	1,054	56.5	18.2	24.2	14.1
	acres	736,977	90,254	31.7	7.1	15.9	8.6
Military service (see text):							
Never served	producers	286,208	14,759	43.0	16.8	15.9	10.4
Served	producers	48,255	5,714	41.4	16.0	13.3	12.1
All producers by age group [1]:							
Under 25 years	farms	4,943	2,049	55.7	13.0	25.4	17.3
25 to 34 years	farms	19,812	5,664	56.5	19.6	22.5	14.4
35 to 44 years	farms	40,941	5,487	50.9	18.4	23.1	9.4
45 to 54 years	farms	72,585	3,448	46.1	16.6	19.5	10.0
55 to 64 years	farms	115,316	3,676	40.9	18.8	13.0	9.0
65 to 74 years	farms	98,628	2,798	39.0	17.4	9.8	11.8
75 years and over	farms	56,281	2,260	36.3	15.4	9.1	11.9
Net cash farm income of operations (see text):							
Farms with gains of [2]-							
Less than $1,000	farms	8,430	407	40.0	18.5	13.1	8.5
	$1,000	3,904	258	38.5	18.1	12.2	8.2
$1,000 to $4,999	farms	16,415	624	32.8	15.3	10.0	7.5
	$1,000	44,308	1,655	32.0	14.7	10.0	7.3
$5,000 to $9,999	farms	9,178	298	27.6	11.4	9.5	6.8
	$1,000	65,849	2,187	27.4	11.2	9.4	6.7
$10,000 to $24,999	farms	11,588	423	27.2	10.0	10.5	6.7
	$1,000	186,639	6,554	27.4	10.1	10.6	6.8
$25,000 to $49,999	farms	6,729	241	28.3	8.1	13.7	6.5
	$1,000	239,631	9,201	28.4	8.0	13.9	6.5
$50,000 or more	farms	13,697	617	27.5	4.5	17.0	6.0
	$1,000	6,602,194	126,208	16.9	3.6	9.0	4.3
Farms with losses of -							
Less than $1,000	farms	12,800	1,790	46.4	20.7	13.5	12.2
	$1,000	6,696	986	47.3	20.7	14.2	12.4
$1,000 to $4,999	farms	52,876	2,225	48.1	22.0	15.1	11.0
	$1,000	153,598	7,585	48.0	21.9	15.3	10.9
$5,000 to $9,999	farms	42,142	2,130	47.3	20.8	16.0	10.5
	$1,000	304,709	15,892	47.3	20.8	16.0	10.5
$10,000 to $24,999	farms	45,852	3,437	46.4	19.4	16.2	10.7
	$1,000	719,743	56,021	46.1	18.9	16.3	10.9
$25,000 to $49,999	farms	17,323	1,749	43.9	16.0	16.9	11.1
	$1,000	595,772	73,552	43.8	15.7	16.7	11.3
$50,000 or more	farms	11,386	615	37.8	14.6	14.2	9.0
	$1,000	1,404,491	55,304	33.6	12.0	13.4	8.2
Livestock and poultry:							
Cattle and calves inventory	farms	152,882	4,183	37.6	16.6	14.1	7.0
	number	12,573,876	343,126	19.2	5.2	8.3	5.7
Beef cows inventory	farms	134,250	3,686	36.1	15.4	13.9	6.8
	number	4,572,742	125,363	20.0	4.9	9.7	5.3
Milk cows inventory	farms	467	67	16.4	3.6	11.4	1.5
	number	531,849	25,765	2.7	1.2	1.0	0.6
Hog and pigs inventory	farms	5,894	869	57.5	24.2	23.2	10.0
	number	1,026,418	46,184	8.4	3.3	1.1	4.0
Layers inventory	farms	28,096	1,562	51.9	21.6	19.4	10.9
	number	21,006,254	1,134,694	1.9	0.6	0.8	0.5
Broilers sold	farms	2,283	508	58.2	19.8	27.2	11.2
	number	619,061,221	68,274,219	38.0	9.9	20.4	7.7
Aquaculture sold	farms	242	70	29.1	15.1	7.4	6.6
	$1,000	69,272	2,288	1.1	0.7	0.1	0.4
Selected crops harvested:							
Corn for grain	farms	4,175	242	29.2	7.0	16.8	5.4
	acres	2,212,502	128,843	28.6	4.3	19.5	4.8
Durum wheat for grain	farms	-	-	-	-	-	-
	acres	-	-	-	-	-	-
Other spring wheat for grain (see text)	farms	69	9	23.2	13.6	3.4	6.2
	acres	7,163	699	12.2	6.0	2.6	3.7
Winter wheat for grain	farms	5,463	329	28.2	8.0	14.9	5.3
	acres	2,496,076	108,864	24.7	3.9	16.1	4.8
Sorghum for grain	farms	3,156	229	25.6	4.8	16.8	4.0
	acres	1,509,785	84,941	19.9	2.5	14.1	3.2
Soybeans for beans	farms	565	61	22.4	5.0	13.4	4.0
	acres	181,579	12,067	19.5	3.4	12.2	3.9
Rice	farms	272	43	22.8	3.8	15.9	3.1
	acres	155,829	20,720	30.0	4.3	21.5	4.2
Cotton	farms	6,212	185	27.7	4.4	20.2	3.1
	acres	5,778,244	201,886	28.0	2.3	22.8	2.9
Peanuts	farms	576	106	34.4	3.3	25.6	5.5
	acres	209,984	40,291	33.0	2.6	25.7	4.6

See footnote(s) at end of table.

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Table A. **Summary of State Coverage, Nonresponse, and Misclassification Adjustments: 2017** (continued)

[For meaning of abbreviations and symbols, see introductory text.]

Item		Total	Standard error	Adjustment as percent of total	Percent of total adjustment from coverage	Percent of total adjustment from nonresponse	Percent of total adjustment from misclassification
Selected crops harvested: - Con.							
Barley	farms	55	21	34.4	4.2	24.5	5.7
	acres	13,391	4,461	28.4	1.5	23.7	3.2
Oats	farms	474	69	23.6	6.4	12.7	4.5
	acres	60,598	6,486	18.4	3.0	11.3	4.1
Forage - land used for all hay and all haylage, grass silage, and greenchop (see text)	farms	80,028	2,594	37.1	16.0	11.5	9.6
	acres	4,441,854	149,684	30.6	9.6	13.7	7.2
Land in vegetables (see text)	farms	2,248	360	39.6	16.7	17.6	5.3
	acres	97,648	15,184	17.3	3.1	11.1	3.1
Potatoes	farms	470	109	34.7	15.5	14.4	4.7
	acres	22,829	714	2.7	0.9	0.2	1.7
Tomatoes in the open	farms	956	272	39.9	17.0	18.0	4.9
	acres	751	138	29.4	12.7	12.7	4.0
Sweet corn	farms	309	98	38.6	16.2	17.4	5.0
	acres	2,329	645	8.7	0.8	7.5	0.4
Lettuce	farms	151	36	44.4	22.9	16.3	5.2
	acres	142	9	12.3	7.4	2.8	2.2
Land in orchards (see text)	farms	7,598	544	34.4	18.2	10.5	5.6
	acres	176,837	6,464	25.6	10.5	10.2	5.0
Apples	farms	518	210	40.2	22.1	12.3	5.8
	acres	404	198	30.1	13.8	11.8	4.6
Grapes	farms	985	151	29.4	18.1	6.4	4.9
	acres	4,890	624	16.0	9.5	3.1	3.3
Oranges	farms	331	77	43.3	18.1	17.6	7.5
	acres	7,847	1,506	24.4	7.2	11.7	5.4
Almonds	farms	38	(H)	28.3	13.0	10.6	4.7
	acres	83	76	45.3	18.2	13.4	13.8
Land in berries	farms	1,132	164	39.1	20.2	13.0	5.9
	acres	2,080	272	21.6	9.6	8.6	3.3

[1] Data were collected for a maximum of four producers per farm.
[2] Farms with total production expenses equal to market value of agricultural products sold, government payments, and farm-related income are included as farms with gains of less than $1,000.

Table B. **Reliability Estimates of State Totals: 2017**

[For meaning of abbreviations and symbols, see introductory text.]

Item		Total	Coefficient of variation (percent)
Farms	number	248,416	3.5
Land in farms	acres	127,036,184	2.5
Farms by size:			
1 to 9 acres	farms	27,889	13.9
	acres	148,099	13.7
10 to 49 acres	farms	81,616	7.7
	acres	1,975,872	9.1
50 to 69 acres	farms	17,974	3.9
	acres	1,038,695	3.9
70 to 99 acres	farms	17,844	5.7
	acres	1,479,491	5.2
100 to 139 acres	farms	18,310	5.4
	acres	2,114,726	5.6
140 to 179 acres	farms	12,887	6.0
	acres	2,033,823	5.9
180 to 219 acres	farms	9,235	5.2
	acres	1,831,619	5.2
220 to 259 acres	farms	6,281	3.0
	acres	1,496,313	3.0
260 to 499 acres	farms	20,856	4.2
	acres	7,436,129	4.2
500 to 999 acres	farms	15,024	3.8
	acres	10,422,280	3.8
1,000 to 1,999 acres	farms	9,463	8.1
	acres	13,049,936	8.0
2,000 acres or more	farms	11,037	2.1
	acres	84,009,201	3.9
Irrigated land use:			
Harvested cropland	farms	13,925	6.0
	acres	4,054,569	4.1
Pastureland and other land	farms	5,088	10.9
	acres	308,776	9.0
Market value of agricultural products sold (see text)	$1,000	24,924,041	1.7
Farms by value of sales:			
Less than $1,000 (see text)	farms	89,454	7.6
	$1,000	13,872	11.7
$1,000 to $2,499	farms	31,921	5.0
	$1,000	52,648	4.2
$2,500 to $4,999	farms	28,876	3.4
	$1,000	102,712	3.2
$5,000 to $9,999	farms	30,375	3.3
	$1,000	213,935	3.2
$10,000 to $19,999	farms	22,331	2.5
	$1,000	313,118	2.9
$20,000 to $24,999	farms	6,163	4.0
	$1,000	135,605	3.9
$25,000 to $39,999	farms	10,508	3.7
	$1,000	327,566	3.9
$40,000 to $49,999	farms	3,941	6.0
	$1,000	174,203	6.1
$50,000 to $99,999	farms	8,536	3.4
	$1,000	589,795	3.5
$100,000 to $249,999	farms	6,708	5.6
	$1,000	1,041,437	5.5
$250,000 to $499,999	farms	3,493	6.4
	$1,000	1,258,670	6.0
$500,000 to $999,999	farms	2,709	6.5
	$1,000	1,958,453	6.3
$1,000,000 or more	farms	3,401	2.3
	$1,000	18,742,027	1.7
Legal status for tax purposes (see text):			
Family or individual	farms	223,284	3.4
	acres	79,294,606	2.5
Partnership	farms	14,211	13.2
	acres	30,510,113	3.5
Corporation:			
Family held	farms	6,454	8.0
	acres	12,393,859	5.7
Other than family held	farms	813	16.0
	acres	1,849,237	11.1
Other - estate or trust, prison farm, grazing association, American Indian Reservation, etc	farms	3,654	14.1
	acres	2,988,369	6.2
Tenure:			
Full owners	farms	184,279	3.9
	acres	50,128,508	2.8
Part owners	farms	50,564	3.0
	acres	61,029,115	2.9
Tenants	farms	13,573	11.1
	acres	15,878,561	3.9
All principal producer characteristics by [1]-			
Sex of operator:			
Male	farms	215,390	3.7
	acres	117,695,088	2.5
Female	farms	101,932	5.2
	acres	35,429,107	3.5
Primary occupation:			
Farming	farms	128,075	2.5
Other	farms	206,388	7.7

Item		Total	Coefficient of variation (percent)
All principal producer characteristics by [1]- - Con.			
Hispanic, Latino, or Spanish origin (see text)	farms	28,173	13.9
	acres	7,089,991	4.4
Race:			
American Indian or Alaska Native	farms	2,208	25.2
	acres	599,509	37.2
Asian	farms	1,073	19.6
	acres	129,869	21.2
Black or African American	farms	8,011	30.9
	acres	946,751	12.4
Native Hawaiian or Other Pacific Islander	farms	128	80.9
	acres	15,473	52.8
White	farms	237,246	3.7
	acres	125,261,769	2.5
More than one race reported	farms	2,578	40.9
	acres	736,977	12.2
Military service (see text):			
Never served	producers	286,208	5.2
Served	producers	48,255	11.8
All producers by age group [1]:			
Under 25 years	farms	4,943	41.4
25 to 34 years	farms	19,812	28.6
35 to 44 years	farms	40,941	13.4
45 to 54 years	farms	72,585	4.8
55 to 64 years	farms	115,316	3.2
65 to 74 years	farms	98,628	2.8
75 years and over	farms	56,281	4.0
Net cash farm income of operations (see text):			
Farms with gains of [2]-			
Less than $1,000	farms	8,430	4.8
	$1,000	3,904	6.6
$1,000 to $4,999	farms	16,415	3.8
	$1,000	44,308	3.7
$5,000 to $9,999	farms	9,178	3.2
	$1,000	65,849	3.3
$10,000 to $24,999	farms	11,588	3.7
	$1,000	186,639	3.5
$25,000 to $49,999	farms	6,729	3.6
	$1,000	239,631	3.8
$50,000 or more	farms	13,697	4.5
	$1,000	6,602,194	1.9
Farms with losses of -			
Less than $1,000	farms	12,800	14.0
	$1,000	6,696	14.7
$1,000 to $4,999	farms	52,876	4.2
	$1,000	153,598	4.9
$5,000 to $9,999	farms	42,142	5.1
	$1,000	304,709	5.2
$10,000 to $24,999	farms	45,852	7.5
	$1,000	719,743	7.8
$25,000 to $49,999	farms	17,323	10.1
	$1,000	595,772	12.3
$50,000 or more	farms	11,386	5.4
	$1,000	1,404,491	3.9
Livestock and poultry:			
Cattle and calves inventory	farms	152,882	2.7
	number	12,573,876	2.7
Beef cows inventory	farms	134,250	2.7
	number	4,572,742	2.7
Milk cows inventory	farms	467	14.3
	number	531,849	4.8
Hog and pigs inventory	farms	5,894	14.7
	number	1,026,418	4.5
Layers inventory	farms	28,096	5.6
	number	21,006,254	5.4
Broilers sold	farms	2,283	22.2
	number	619,061,221	11.0
Aquaculture sold	farms	242	29.0
	$1,000	69,272	3.3
Selected crops harvested:			
Corn for grain	farms	4,175	5.8
	acres	2,212,502	5.8
Durum wheat for grain	farms	-	-
	acres	-	-
Other spring wheat for grain (see text)	farms	69	13.2
	acres	7,163	9.8
Winter wheat for grain	farms	5,463	6.0
	acres	2,496,076	4.4
Sorghum for grain	farms	3,156	7.2
	acres	1,509,785	5.6
Soybeans for beans	farms	565	10.8
	acres	181,579	6.6
Rice	farms	272	15.9
	acres	155,829	13.3
Cotton	farms	6,212	3.0
	acres	5,778,244	3.5

See footnote(s) at end of table.

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Table B. **Reliability Estimates of State Totals: 2017** (continued)

[For meaning of abbreviations and symbols, see introductory text.]

Item		Total	Coefficient of variation (percent)
Selected crops harvested: - Con.			
Peanuts	farms	576	18.4
	acres	209,984	19.2
Barley	farms	55	38.2
	acres	13,391	33.3
Oats	farms	474	14.6
	acres	60,598	10.7
Forage - land used for all hay and all haylage, grass silage, and greenchop (see text)	farms	80,028	3.2
	acres	4,441,854	3.4
Land in vegetables (see text)	farms	2,248	16.0
	acres	97,648	15.5
Potatoes	farms	470	23.3
	acres	22,829	3.1
Tomatoes in the open	farms	956	28.4
	acres	751	18.4
Selected crops harvested: - Con. Land in vegetables (see text) - Con.			
Sweet corn	farms	309	31.8
	acres	2,329	27.7
Lettuce	farms	151	24.1
	acres	142	6.0
Land in orchards (see text)	farms	7,598	7.2
	acres	176,837	3.7
Apples	farms	518	40.5
	acres	404	49.0
Grapes	farms	985	15.3
	acres	4,890	12.8
Oranges	farms	331	23.2
	acres	7,847	19.2
Almonds	farms	38	(H)
	acres	83	90.9
Land in berries	farms	1,132	14.5
	acres	2,080	13.1

[1] Data were collected for a maximum of four producers per farm.
[2] Farms with total production expenses equal to market value of agricultural products sold, government payments, and farm-related income are included as farms with gains of less than $1,000.

Table C. **Summary of Coverage, Nonresponse, and Misclassification Adjustments by County: 2017**

[For meaning of abbreviations and symbols, see introductory text.]

Geographic area	Total (number)	Standard error	Adjustment as percent of total	Percent of total adjustment from coverage	Percent of total adjustment from nonresponse	Percent of total adjustment from misclassification
ALL FARMS (NUMBER)						
State Total						
Texas	248,416	8,706	42.1	17.8	14.5	9.8
Counties						
Anderson	1,754	320	39.6	17.6	13.3	8.7
Andrews	156	69	45.1	21.0	18.4	5.8
Angelina	1,028	209	46.8	23.7	11.9	11.2
Aransas	97	46	34.0	14.6	12.9	6.5
Archer	532	209	38.4	12.9	17.9	7.6
Armstrong	216	52	30.8	15.3	9.3	6.3
Atascosa	1,681	455	35.2	14.1	12.4	8.6
Austin	2,113	354	40.4	17.6	13.5	9.3
Bailey	449	230	36.9	5.9	19.1	11.8
Bandera	897	219	47.9	22.2	13.8	11.8
Bastrop	2,120	355	42.6	17.7	15.3	9.6
Baylor	223	61	34.3	14.7	13.1	6.5
Bee	943	134	43.2	21.3	13.5	8.5
Bell	2,436	433	41.3	18.2	13.4	9.7
Bexar	2,520	316	50.0	23.1	16.8	10.1
Blanco	1,032	179	48.5	22.9	13.9	11.7
Borden	127	23	29.0	13.6	9.6	5.8
Bosque	1,305	65	34.1	17.8	7.7	8.6
Bowie	1,506	183	42.8	19.0	14.5	9.3
Brazoria	2,851	273	48.4	22.9	16.9	8.7
Brazos	1,363	291	38.0	15.7	14.3	8.0
Brewster	174	104	32.8	10.2	14.0	8.7
Briscoe	249	34	29.5	12.3	9.7	7.5
Brooks	437	85	52.3	27.5	15.0	9.8
Brown	1,838	286	40.8	19.5	11.9	9.5
Burleson	1,648	348	39.6	17.3	12.7	9.6
Burnet	1,623	402	42.3	20.4	11.9	10.1
Caldwell	1,517	265	44.2	19.5	14.8	9.8
Calhoun	290	54	40.0	21.0	9.2	9.8
Callahan	961	152	39.8	19.5	9.6	10.6
Cameron	1,418	312	51.9	25.0	17.3	9.6
Camp	484	84	42.2	22.8	9.0	10.4
Carson	331	64	41.1	13.8	19.2	8.1
Cass	1,081	190	48.5	21.9	14.9	11.6
Castro	411	73	29.3	12.6	10.5	6.2
Chambers	562	162	42.9	20.5	13.5	8.9
Cherokee	1,587	206	41.9	16.1	16.5	9.3
Childress	285	49	25.9	9.8	10.1	5.9
Clay	851	88	31.0	14.2	9.5	7.2
Cochran	286	34	39.9	15.5	15.5	8.9
Coke	449	80	41.6	20.0	11.8	9.8
Coleman	976	(H)	38.5	6.9	12.0	19.6
Collin	2,706	335	51.4	24.7	14.8	11.9
Collingsworth	301	44	25.9	13.2	6.5	6.2
Colorado	1,773	378	38.3	12.0	16.4	9.9
Comal	1,068	105	43.6	23.1	11.3	9.2
Comanche	1,427	202	37.2	13.1	13.4	10.8
Concho	396	71	32.6	15.9	8.2	8.5
Cooke	2,284	572	40.1	14.7	15.5	10.0
Coryell	1,479	313	43.0	18.4	14.8	9.8
Cottle	154	11	-5.0	-1.5	-2.4	-1.1
Crane	30	12	30.0	20.4	1.6	8.1
Crockett	219	49	35.9	19.0	7.9	9.0
Crosby	343	55	27.8	6.7	15.6	5.5
Culberson	66	18	42.0	16.6	12.8	12.5
Dallam	340	50	36.3	8.6	20.3	7.4
Dallas	775	343	58.2	20.0	24.1	14.1
Dawson	386	54	22.8	7.1	10.5	5.2
Deaf Smith	562	228	31.4	9.3	15.9	6.2
Delta	571	267	46.0	16.4	19.6	10.0
Denton	3,295	409	50.5	26.2	12.8	11.4
DeWitt	1,768	359	34.1	14.3	11.8	8.0
Dickens	393	41	30.7	13.9	10.1	6.8
Dimmit	328	47	51.4	31.9	6.7	12.8
Donley	283	51	16.0	8.5	3.2	4.3
Duval	1,367	194	53.4	26.3	16.5	10.5
Eastland	1,198	110	40.4	21.2	8.8	10.4
Ector	275	(H)	56.4	19.2	28.9	8.3
Edwards	380	67	39.5	22.8	8.3	8.5
Ellis	2,551	854	42.9	15.8	17.7	9.4
El Paso	656	327	55.0	22.8	19.5	12.6
Erath	2,402	263	41.2	18.5	13.9	8.8
Falls	1,103	273	34.8	10.8	16.2	7.7
Fannin	2,255	166	40.4	20.6	11.5	8.2
Fayette	3,166	315	36.9	17.1	11.6	8.2
Fisher	486	96	34.1	14.4	12.5	7.2
Floyd	440	62	27.8	6.6	15.4	5.8
Foard	172	40	32.1	11.7	11.4	9.0
Fort Bend	1,155	136	43.9	18.9	16.2	8.9
Franklin	493	100	30.9	10.9	12.2	7.8
Freestone	1,459	400	45.3	16.0	18.3	11.0
Frio	663	163	43.0	18.0	17.4	7.6
Gaines	507	199	29.8	4.7	19.2	5.9
Galveston	633	240	41.8	21.9	12.0	7.9

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Table C. **Summary of Coverage, Nonresponse, and Misclassification Adjustments by County: 2017** (continued)

[For meaning of abbreviations and symbols, see introductory text.]

Geographic area	Total (number)	Standard error	Adjustment as percent of total	Percent of total adjustment from coverage	Percent of total adjustment from nonresponse	Percent of total adjustment from misclassification
ALL FARMS (NUMBER) - Con.						
Counties - Con.						
Garza	237	51	21.3	10.0	5.9	5.4
Gillespie	2,079	474	41.3	19.6	12.0	9.8
Glasscock	175	14	32.7	19.3	6.2	7.1
Goliad	1,255	126	46.5	23.4	13.0	10.0
Gonzales	1,612	234	28.9	12.3	10.0	6.6
Gray	348	113	35.2	12.9	15.8	6.5
Grayson	2,845	729	42.8	17.2	16.4	9.2
Gregg	541	185	52.7	21.3	16.3	15.1
Grimes	1,771	199	40.6	16.3	15.3	9.0
Guadalupe	2,543	289	43.3	19.7	15.1	8.6
Hale	671	285	33.5	9.1	16.4	8.0
Hall	327	46	33.4	12.3	13.4	7.6
Hamilton	1,163	190	38.4	16.9	13.2	8.3
Hansford	181	35	23.4	6.8	12.4	4.2
Hardeman	275	43	33.9	15.9	11.0	7.0
Hardin	661	170	46.1	18.7	16.8	10.6
Harris	1,891	404	51.5	20.9	19.8	10.8
Harrison	1,134	267	42.8	19.7	12.7	10.4
Hartley	206	34	35.0	11.6	15.1	8.3
Haskell	488	81	34.8	13.5	10.9	10.4
Hays	1,128	131	47.6	25.4	10.9	11.3
Hemphill	230	35	37.3	18.8	10.1	8.4
Henderson	1,988	338	38.4	16.4	12.5	9.5
Hidalgo	2,436	941	60.6	21.2	28.4	11.0
Hill	2,003	611	38.0	13.6	16.3	8.1
Hockley	661	274	29.8	8.2	15.2	6.4
Hood	1,176	349	40.7	19.0	12.3	9.5
Hopkins	2,200	267	41.2	19.1	12.3	9.8
Houston	1,422	141	41.1	15.8	15.4	9.9
Howard	373	118	36.9	14.6	13.9	8.5
Hudspeth	134	40	34.9	14.1	12.0	8.9
Hunt	4,110	795	46.0	20.5	14.6	10.9
Hutchinson	149	35	25.0	13.2	7.0	4.8
Irion	175	45	32.8	18.3	6.8	7.6
Jack	870	157	32.0	17.0	7.3	7.7
Jackson	788	189	33.2	12.3	12.9	7.9
Jasper	896	254	37.8	22.7	8.0	7.1
Jeff Davis	77	14	20.8	11.9	1.6	7.3
Jefferson	729	588	39.4	13.6	13.5	12.3
Jim Hogg	244	56	47.9	20.4	19.3	8.2
Jim Wells	1,224	336	57.0	24.8	21.6	10.6
Johnson	3,140	406	45.8	19.8	15.0	11.0
Jones	915	156	40.0	18.9	11.1	10.0
Karnes	1,213	270	37.2	13.7	15.7	7.8
Kaufman	2,778	415	44.3	20.7	14.6	8.9
Kendall	1,349	326	47.8	21.4	14.6	11.8
Kenedy	30	9	23.3	11.0	2.3	10.0
Kent	164	67	7.4	4.3	1.5	1.7
Kerr	1,128	153	50.7	25.2	12.4	13.1
Kimble	670	72	43.9	26.9	5.3	11.8
King	43	13	23.3	10.5	4.3	8.4
Kinney	236	54	46.0	24.5	8.6	12.9
Kleberg	459	228	54.0	16.8	28.4	8.8
Knox	216	61	35.1	13.3	13.5	8.3
Lamar	1,946	132	41.4	21.2	11.7	8.5
Lamb	777	144	38.4	12.3	14.6	11.4
Lampasas	1,151	266	42.2	18.6	13.9	9.7
La Salle	383	115	41.8	20.8	7.2	13.8
Lavaca	2,900	280	37.0	16.2	13.0	7.8
Lee	1,809	135	34.2	14.0	13.1	7.1
Leon	1,951	109	44.2	18.4	14.3	11.5
Liberty	1,538	183	46.4	18.9	19.0	8.5
Limestone	1,284	233	32.1	14.8	9.8	7.5
Lipscomb	299	49	30.0	11.0	12.5	6.6
Live Oak	856	279	36.3	18.8	10.8	6.6
Llano	835	239	42.2	15.4	16.0	10.8
Loving	8	1	(Z)	(Z)	(Z)	(Z)
Lubbock	1,033	414	41.9	15.5	17.2	9.1
Lynn	434	73	35.9	11.1	18.2	6.5
McCulloch	682	91	41.2	21.1	9.7	10.4
McLennan	3,366	239	45.5	21.8	14.0	9.7
McMullen	191	91	34.1	15.4	10.0	8.6
Madison	977	147	41.6	19.6	13.0	9.0
Marion	280	76	42.9	16.5	16.7	9.7
Martin	356	72	35.1	10.3	19.1	5.8
Mason	680	130	38.0	14.6	13.6	9.8
Matagorda	858	200	40.0	15.1	16.9	8.0
Maverick	339	313	59.2	16.7	27.2	15.4
Medina	2,281	274	45.5	22.8	13.2	9.6
Menard	346	99	38.7	17.2	12.3	9.3
Midland	410	298	49.7	21.8	17.1	10.7
Milam	2,053	281	38.6	20.1	10.2	8.2
Mills	896	211	38.5	15.7	13.1	9.7
Mitchell	362	97	26.5	13.6	7.4	5.5
Montague	1,615	276	37.8	18.7	10.8	8.2
Montgomery	1,614	312	50.0	20.2	18.2	11.5
Moore	250	54	32.0	16.9	9.7	5.4
Morris	449	80	48.9	16.7	19.8	12.5

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Table C. **Summary of Coverage, Nonresponse, and Misclassification Adjustments by County: 2017** (continued)

[For meaning of abbreviations and symbols, see introductory text.]

Geographic area	Total (number)	Standard error	Adjustment as percent of total	Percent of total adjustment from coverage	Percent of total adjustment from nonresponse	Percent of total adjustment from misclassification
ALL FARMS (NUMBER) - Con.						
Counties - Con.						
Motley	237	45	34.6	13.4	14.7	6.5
Nacogdoches	1,123	435	38.6	11.2	15.7	11.8
Navarro	2,471	232	42.4	21.0	12.4	9.0
Newton	430	103	51.2	23.0	16.0	12.2
Nolan	410	81	33.5	15.5	9.6	8.4
Nueces	646	266	43.0	17.9	15.6	9.5
Ochiltree	282	53	27.0	9.2	13.2	4.6
Oldham	132	10	21.5	6.2	8.9	6.4
Orange	663	192	44.4	21.1	15.1	8.2
Palo Pinto	1,265	268	39.7	20.3	10.8	8.6
Panola	978	211	42.1	15.7	15.4	10.9
Parker	4,626	1,486	46.4	20.0	13.2	13.1
Parmer	464	57	29.5	11.0	12.4	6.2
Pecos	309	39	43.7	24.0	6.6	13.1
Polk	742	228	45.4	17.5	16.9	10.9
Potter	239	54	45.1	27.1	8.4	9.5
Presidio	142	19	40.0	16.6	16.0	7.4
Rains	787	616	42.9	11.0	19.8	12.1
Randall	781	160	38.4	18.2	11.2	9.0
Reagan	112	31	34.4	14.6	12.9	6.9
Real	198	64	41.2	22.6	6.3	12.3
Red River	1,126	172	34.0	14.6	11.4	8.0
Reeves	224	(H)	49.8	10.9	26.8	12.1
Refugio	238	76	29.6	13.3	11.1	5.3
Roberts	104	25	35.6	17.7	6.3	11.6
Robertson	1,471	239	39.1	15.7	14.8	8.6
Rockwall	403	97	49.8	27.6	12.2	10.0
Runnels	833	123	32.8	14.9	10.2	7.6
Rusk	1,441	667	47.7	11.5	18.6	17.5
Sabine	200	60	39.4	17.6	14.3	7.6
San Augustine	293	73	46.0	23.2	11.8	11.0
San Jacinto	786	200	52.0	20.0	19.6	12.4
San Patricio	656	161	45.6	18.1	15.2	12.4
San Saba	773	129	36.4	15.0	13.0	8.4
Schleicher	327	288	35.4	14.3	13.7	7.4
Scurry	560	136	34.5	15.9	10.6	8.0
Shackelford	223	47	27.0	12.6	8.1	6.2
Shelby	995	370	40.2	16.3	15.4	8.5
Sherman	245	35	20.6	6.7	9.3	4.5
Smith	2,928	2,166	49.6	14.6	17.4	17.7
Somervell	352	99	39.1	20.3	10.2	8.6
Starr	1,345	415	57.3	23.6	23.5	10.2
Stephens	575	104	44.5	22.8	11.7	10.0
Sterling	76	16	27.6	16.1	2.5	9.0
Stonewall	314	62	31.8	19.1	3.0	9.7
Sutton	261	(H)	35.3	6.3	18.5	10.5
Swisher	432	26	26.8	8.8	12.9	5.2
Tarrant	1,173	249	47.0	23.6	12.4	11.0
Taylor	1,394	362	49.1	22.5	14.4	12.3
Terrell	85	25	41.2	14.0	16.4	10.8
Terry	558	158	33.0	8.3	17.4	7.4
Throckmorton	274	88	35.3	13.1	10.8	11.4
Titus	812	158	40.6	23.3	9.0	8.4
Tom Green	1,303	248	47.7	22.9	14.7	10.1
Travis	1,099	256	49.2	22.0	16.2	11.1
Trinity	601	143	40.3	17.7	13.9	8.8
Tyler	778	162	48.5	22.5	15.1	10.8
Upshur	1,652	338	47.5	19.3	18.1	10.1
Upton	98	75	41.8	12.7	13.9	15.2
Uvalde	592	212	34.7	11.6	14.6	8.4
Val Verde	528	380	58.3	20.9	23.9	13.5
Van Zandt	3,405	340	41.1	17.6	14.4	9.0
Victoria	1,286	284	30.1	13.7	10.3	6.1
Walker	1,441	844	44.2	14.3	19.7	10.1
Waller	1,881	357	40.8	15.3	16.4	9.1
Ward	102	42	46.1	20.3	15.7	10.0
Washington	2,607	458	40.4	15.4	14.6	10.4
Webb	656	187	51.8	26.3	16.0	9.5
Wharton	1,500	235	41.6	15.2	18.7	7.7
Wheeler	510	109	31.9	16.1	8.6	7.1
Wichita	614	86	40.8	20.9	10.8	9.0
Wilbarger	395	68	36.8	17.5	11.2	8.0
Willacy	351	73	45.2	21.5	15.8	7.9
Williamson	2,634	676	43.0	17.9	15.7	9.4
Wilson	2,621	475	41.6	16.7	15.4	9.5
Winkler	46	11	41.3	27.8	3.5	10.0
Wise	3,697	792	45.6	19.7	15.1	10.8
Wood	1,587	228	42.4	19.7	13.9	8.8
Yoakum	291	105	34.8	11.5	16.4	6.8
Young	853	191	38.4	16.6	13.8	8.1
Zapata	412	160	52.0	20.7	22.6	8.8
Zavala	281	242	44.0	18.7	13.7	11.6

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Table C. **Summary of Coverage, Nonresponse, and Misclassification Adjustments by County: 2017** (continued)

[For meaning of abbreviations and symbols, see introductory text.]

Geographic area	Total (number)	Standard error	Adjustment as percent of total	Percent of total adjustment from coverage	Percent of total adjustment from nonresponse	Percent of total adjustment from misclassification
LAND IN FARMS (ACRES)						
State Total						
Texas	127,036,184	3,219,092	23.0	5.8	8.3	8.9
Counties						
Anderson	400,571	77,027	35.1	11.6	15.9	7.7
Andrews	886,765	175,612	9.9	1.2	3.2	5.5
Angelina	103,947	10,295	37.7	20.3	7.8	9.6
Aransas	53,912	5,986	0.4	0.2	(Z)	0.2
Archer	560,238	70,602	25.3	8.5	8.7	8.1
Armstrong	442,699	77,557	25.7	8.6	7.5	9.7
Atascosa	745,721	228,889	18.7	5.2	6.0	7.5
Austin	330,481	41,960	34.0	9.7	15.9	8.4
Bailey	498,909	39,617	34.7	5.5	21.8	7.4
Bandera	403,311	90,622	42.5	19.7	10.9	12.0
Bastrop	339,689	60,423	30.2	8.8	15.0	6.4
Baylor	555,176	81,805	10.7	1.0	2.4	7.3
Bee	482,787	109,379	34.5	10.7	16.7	7.1
Bell	487,052	55,133	15.0	5.8	5.9	3.3
Bexar	331,904	42,265	39.3	15.2	13.7	10.4
Blanco	336,688	38,757	42.8	20.6	9.9	12.3
Borden	494,429	31,291	17.1	4.3	5.5	7.3
Bosque	626,135	56,816	29.1	9.6	11.9	7.7
Bowie	294,461	45,415	38.0	11.0	18.7	8.4
Brazoria	460,005	34,986	28.3	10.1	11.6	6.6
Brazos	290,539	63,213	24.7	3.4	17.0	4.3
Brewster	2,018,524	223,750	10.0	1.5	2.4	6.0
Briscoe	553,233	40,187	17.2	3.9	7.1	6.2
Brooks	458,872	38,363	14.8	3.4	1.5	9.9
Brown	546,768	115,393	24.2	8.8	10.4	5.1
Burleson	333,334	31,584	33.1	15.1	8.5	9.4
Burnet	432,990	36,810	29.7	10.6	11.9	7.2
Caldwell	285,170	37,551	32.0	14.0	10.0	8.0
Calhoun	189,516	21,338	18.4	6.3	5.7	6.3
Callahan	477,812	66,940	10.3	3.0	4.7	2.6
Cameron	271,480	42,021	33.7	8.3	20.6	4.7
Camp	77,255	7,920	22.3	11.3	4.1	6.9
Carson	521,065	124,291	36.1	4.9	26.0	5.2
Cass	177,198	22,926	45.0	21.9	12.3	10.9
Castro	554,807	71,893	25.6	3.5	17.2	4.8
Chambers	205,397	39,663	19.7	4.5	10.9	4.3
Cherokee	275,568	35,668	29.3	10.4	10.9	8.0
Childress	444,345	40,099	3.7	0.8	0.4	2.5
Clay	647,511	63,751	23.5	5.3	11.5	6.6
Cochran	486,085	72,596	46.3	9.4	29.0	8.0
Coke	469,303	41,017	27.7	11.4	6.4	10.0
Coleman	672,281	109,783	23.1	6.9	7.9	8.3
Collin	280,790	110,975	34.9	8.7	19.0	7.3
Collingsworth	407,147	37,500	19.4	6.4	8.6	4.4
Colorado	562,549	54,459	33.6	7.2	18.4	8.0
Comal	206,493	85,968	34.3	17.4	10.2	6.7
Comanche	486,940	48,708	27.3	7.4	12.8	7.1
Concho	560,997	63,912	20.1	6.8	7.5	5.7
Cooke	492,329	50,758	34.3	10.0	15.9	8.4
Coryell	456,973	37,932	22.1	7.9	8.9	5.3
Cottle	578,926	39,808	-0.4	-0.0	-0.1	-0.2
Crane	244,095	25,186	7.6	2.3	0.5	4.9
Crockett	1,534,106	621,754	20.2	3.8	10.8	5.6
Crosby	550,520	41,118	14.7	2.3	7.7	4.7
Culberson	1,504,201	210,923	20.3	1.5	3.2	15.6
Dallam	895,330	54,998	35.2	4.7	23.4	7.1
Dallas	63,949	16,444	48.8	18.3	19.0	11.5
Dawson	535,641	100,127	17.2	0.5	13.8	2.8
Deaf Smith	967,487	94,345	26.9	2.5	20.1	4.3
Delta	143,897	23,323	25.7	8.3	10.3	7.0
Denton	359,442	31,875	37.4	9.8	20.7	7.0
DeWitt	483,908	48,689	22.3	6.2	10.3	5.9
Dickens	543,141	27,496	12.6	1.8	4.6	6.2
Dimmit	484,147	93,930	22.6	8.7	3.0	10.9
Donley	593,195	43,556	2.8	0.9	0.4	1.4
Duval	836,283	129,130	29.5	13.2	6.8	9.4
Eastland	489,773	66,267	30.1	13.0	7.2	10.0
Ector	557,889	150,703	41.9	11.3	8.4	22.1
Edwards	1,013,306	114,441	29.7	9.6	8.8	11.4
Ellis	473,413	77,036	35.5	10.3	17.2	8.0
El Paso	142,675	7,709	8.0	3.1	1.8	3.1
Erath	625,532	61,770	23.2	7.9	9.8	5.5
Falls	391,898	35,039	21.0	4.2	10.6	6.3
Fannin	481,997	49,055	25.4	8.4	10.9	6.1
Fayette	521,522	63,357	29.5	11.1	11.0	7.4
Fisher	477,958	83,268	28.0	4.8	19.2	4.0
Floyd	638,934	100,998	29.7	4.9	20.8	3.9
Foard	439,886	45,515	19.5	7.6	4.1	7.9
Fort Bend	279,483	51,390	30.8	6.1	20.7	4.0
Franklin	102,604	12,034	14.6	3.5	7.4	3.6
Freestone	414,112	73,524	38.3	9.0	20.1	9.1
Frio	677,994	93,096	34.7	9.9	17.0	7.8
Gaines	857,942	290,854	17.0	1.4	12.5	3.2
Galveston	73,125	26,442	14.7	4.5	7.8	2.3

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Table C. **Summary of Coverage, Nonresponse, and Misclassification Adjustments by County: 2017** (continued)

[For meaning of abbreviations and symbols, see introductory text.]

Geographic area	Total (number)	Standard error	Adjustment as percent of total	Percent of total adjustment from coverage	Percent of total adjustment from nonresponse	Percent of total adjustment from misclassification
LAND IN FARMS (ACRES) - Con.						
Counties - Con.						
Garza	415,739	53,390	-7.8	-2.4	-2.0	-3.4
Gillespie	679,995	43,140	33.7	14.1	9.2	10.4
Glasscock	496,214	30,359	23.8	7.2	3.7	12.8
Goliad	379,929	36,833	34.7	12.2	13.4	9.1
Gonzales	614,280	115,933	16.6	4.0	7.5	5.1
Gray	483,257	209,619	18.1	2.3	11.3	4.6
Grayson	429,933	55,874	37.0	10.5	18.6	7.9
Gregg	57,704	24,720	62.4	17.8	29.8	14.8
Grimes	340,833	55,489	29.9	8.2	14.9	6.8
Guadalupe	359,485	36,950	34.4	14.6	12.4	7.4
Hale	584,023	37,439	24.4	3.6	17.2	3.5
Hall	494,247	53,859	32.7	5.1	23.2	4.4
Hamilton	483,812	58,758	28.9	9.5	12.3	7.2
Hansford	587,021	137,358	16.7	1.7	11.9	3.1
Hardeman	294,741	34,097	21.9	6.9	10.3	4.7
Hardin	65,087	22,407	26.8	11.6	8.3	6.8
Harris	218,659	62,995	26.5	8.9	10.0	7.6
Harrison	190,247	43,061	34.0	10.1	14.1	9.8
Hartley	834,650	43,413	12.8	2.2	2.5	8.0
Haskell	565,019	59,752	20.8	5.9	6.3	8.5
Hays	263,239	67,925	40.9	16.1	13.3	11.5
Hemphill	528,045	80,774	20.5	4.1	10.3	6.1
Henderson	310,355	40,291	29.1	8.8	13.0	7.3
Hidalgo	623,875	77,877	30.1	8.0	16.3	5.8
Hill	523,070	38,953	28.6	8.9	13.6	6.2
Hockley	524,733	51,262	23.3	4.1	14.4	4.8
Hood	205,407	35,627	26.3	11.1	8.3	6.8
Hopkins	394,887	66,789	31.3	9.2	13.4	8.7
Houston	394,543	41,784	25.0	6.4	11.9	6.7
Howard	520,963	144,888	22.5	1.1	16.7	4.7
Hudspeth	2,276,024	451,386	7.7	1.2	0.5	6.0
Hunt	482,794	70,948	38.2	18.7	10.9	8.7
Hutchinson	548,134	59,934	10.7	2.3	4.7	3.8
Irion	612,647	202,382	27.0	5.9	14.6	6.5
Jack	467,575	58,579	13.5	3.5	7.0	3.0
Jackson	382,387	130,841	20.1	5.1	8.7	6.3
Jasper	91,437	18,777	27.3	9.3	9.1	8.9
Jeff Davis	1,378,004	216,912	4.9	0.4	0.1	4.4
Jefferson	358,934	13,369	9.4	2.4	3.2	3.7
Jim Hogg	691,997	85,482	16.6	2.9	2.7	11.0
Jim Wells	426,118	52,035	35.2	13.9	13.0	8.3
Johnson	411,151	61,812	38.3	11.0	18.8	8.5
Jones	516,507	74,914	28.6	9.5	13.6	5.5
Karnes	431,809	66,850	26.7	8.2	12.1	6.4
Kaufman	455,021	61,005	36.2	11.5	16.0	8.8
Kendall	393,935	47,579	43.6	22.2	9.2	12.2
Kenedy	868,838	110,428	0.4	0.1	(Z)	0.3
Kent	577,532	37,137	-1.2	-0.4	-0.3	-0.6
Kerr	517,518	56,940	41.7	20.3	8.7	12.7
Kimble	746,308	140,970	38.0	20.0	5.8	12.2
King	417,111	28,759	1.7	0.4	(Z)	1.3
Kinney	587,026	36,993	30.8	14.1	3.3	13.3
Kleberg	482,517	72,280	6.1	0.4	0.2	5.5
Knox	488,811	66,704	6.0	0.5	1.7	3.8
Lamar	463,905	52,452	34.8	11.5	13.9	9.4
Lamb	569,201	52,648	36.6	3.3	29.1	4.3
Lampasas	469,013	75,153	20.8	5.6	9.6	5.6
La Salle	532,903	161,387	33.3	12.2	6.6	14.5
Lavaca	506,548	92,059	28.4	12.1	8.9	7.4
Lee	328,668	31,525	19.3	6.3	7.3	5.7
Leon	487,598	47,523	33.0	10.7	12.7	9.5
Liberty	252,488	99,414	27.1	6.8	13.3	7.0
Limestone	492,631	94,198	13.8	3.0	6.1	4.7
Lipscomb	586,278	40,172	27.2	5.0	16.0	6.2
Live Oak	454,933	106,372	20.4	8.0	8.4	4.0
Llano	523,436	72,151	33.4	13.4	9.0	11.0
Loving	468,140	93,371	(Z)	(Z)	(Z)	(Z)
Lubbock	530,620	58,066	34.9	6.7	24.1	4.2
Lynn	499,206	77,199	36.7	5.7	26.8	4.1
McCulloch	563,110	40,098	27.7	8.4	4.4	15.0
McLennan	573,288	46,911	34.2	12.6	14.0	7.6
McMullen	451,626	80,421	28.8	8.4	7.9	12.6
Madison	245,552	46,675	34.6	9.7	17.5	7.3
Marion	49,946	23,814	45.5	8.0	25.7	11.8
Martin	444,558	38,815	31.1	5.4	22.2	3.5
Mason	539,413	44,811	26.9	9.0	10.0	7.8
Matagorda	551,385	55,339	27.8	3.2	19.0	5.7
Maverick	434,466	60,480	17.4	3.0	6.5	7.9
Medina	782,391	89,504	33.7	14.8	7.9	11.0
Menard	507,567	60,108	23.8	6.7	5.9	11.3
Midland	344,988	79,535	24.4	7.7	7.9	8.8
Milam	497,481	58,071	28.9	9.9	11.7	7.4
Mills	441,194	73,713	31.4	7.3	16.2	7.9
Mitchell	583,017	52,275	4.6	1.5	0.7	2.4
Montague	498,229	33,167	29.5	8.4	15.2	5.9
Montgomery	144,872	51,424	37.1	11.5	15.0	10.7
Moore	477,769	45,223	10.3	1.9	6.2	2.2
Morris	73,903	8,564	30.8	10.5	11.2	9.1

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Table C. **Summary of Coverage, Nonresponse, and Misclassification Adjustments by County: 2017** (continued)

[For meaning of abbreviations and symbols, see introductory text.]

Geographic area	Total (number)	Standard error	Adjustment as percent of total	Percent of total adjustment from coverage	Percent of total adjustment from nonresponse	Percent of total adjustment from misclassification
LAND IN FARMS (ACRES) - Con.						
Counties - Con.						
Motley	579,649	38,679	10.0	1.2	2.5	6.3
Nacogdoches	264,750	96,976	40.7	9.3	22.7	8.7
Navarro	558,947	36,965	32.6	12.4	13.2	7.1
Newton	58,793	14,706	24.4	7.9	4.1	12.4
Nolan	466,360	68,773	18.7	4.4	9.1	5.3
Nueces	474,868	46,972	5.0	0.7	1.7	2.6
Ochiltree	568,604	130,904	21.6	2.0	16.9	2.6
Oldham	944,660	228,506	11.4	1.3	0.7	9.4
Orange	52,912	10,556	25.3	11.9	7.2	6.1
Palo Pinto	572,847	104,171	34.3	14.0	6.1	14.2
Panola	205,961	27,856	35.5	11.8	13.9	9.7
Parker	521,702	69,044	38.4	14.3	14.2	9.8
Parmer	548,967	50,697	20.1	1.2	14.6	4.3
Pecos	2,867,712	204,559	17.1	2.6	1.4	13.1
Polk	125,133	27,813	36.4	14.3	12.5	9.7
Potter	423,798	25,975	7.4	1.7	0.8	4.8
Presidio	1,841,317	276,073	19.2	5.0	1.7	12.6
Rains	111,443	66,850	22.5	9.6	7.4	5.5
Randall	560,384	61,761	21.0	4.4	8.2	8.4
Reagan	736,332	84,418	12.2	2.2	2.9	7.2
Real	316,914	161,296	29.0	8.6	5.3	15.0
Red River	458,494	41,014	27.1	7.0	12.4	7.7
Reeves	1,063,899	83,120	5.4	1.0	0.6	3.8
Refugio	488,635	106,558	10.4	1.5	3.6	5.3
Roberts	553,095	45,915	18.6	3.6	1.1	13.8
Robertson	474,785	68,359	23.7	6.1	10.1	7.5
Rockwall	40,384	11,638	31.6	14.0	10.8	6.8
Runnels	672,304	82,595	20.2	5.6	8.7	5.9
Rusk	242,767	25,443	39.9	10.6	21.0	8.3
Sabine	38,304	25,483	36.6	11.4	19.7	5.6
San Augustine	61,806	11,233	34.6	12.1	13.8	8.7
San Jacinto	84,442	11,026	34.2	12.7	13.4	8.1
San Patricio	370,780	66,867	32.1	5.6	18.5	8.1
San Saba	660,016	59,920	21.2	8.3	6.2	6.7
Schleicher	810,982	112,641	16.1	5.1	5.1	5.9
Scurry	530,804	64,148	28.7	9.0	11.4	8.3
Shackelford	536,848	53,460	10.7	1.9	6.0	2.9
Shelby	179,084	18,845	26.0	8.6	10.8	6.6
Sherman	590,246	30,841	9.7	2.2	3.3	4.2
Smith	271,765	83,016	45.9	14.6	15.9	15.4
Somervell	82,967	24,393	22.2	5.7	10.0	6.6
Starr	571,483	95,149	42.5	16.1	17.2	9.2
Stephens	470,191	55,636	39.8	18.5	9.5	11.8
Sterling	584,290	12,488	2.4	0.8	0.1	1.6
Stonewall	468,896	63,137	35.9	16.2	4.3	15.4
Sutton	900,864	107,203	19.8	5.2	6.1	8.5
Swisher	563,461	52,252	30.6	3.8	23.3	3.6
Tarrant	190,682	50,435	33.3	9.5	16.0	7.8
Taylor	484,257	95,249	48.5	19.7	18.0	10.8
Terrell	835,111	78,946	17.7	3.5	6.8	7.4
Terry	495,799	62,453	33.6	5.8	21.8	6.0
Throckmorton	506,892	56,248	16.6	4.1	2.3	10.2
Titus	158,876	66,113	36.2	10.2	18.4	7.6
Tom Green	812,885	96,062	18.9	5.7	7.4	5.8
Travis	221,900	24,230	38.9	12.9	18.3	7.7
Trinity	98,887	33,080	31.8	9.1	14.5	8.3
Tyler	91,143	14,328	39.7	19.7	7.4	12.6
Upshur	185,287	17,507	39.7	16.0	14.0	9.8
Upton	725,139	84,499	16.1	2.9	2.0	11.2
Uvalde	987,187	138,344	2.5	0.3	0.3	1.9
Val Verde	1,471,377	256,630	27.5	8.3	3.2	16.0
Van Zandt	379,725	55,798	23.7	9.0	8.7	5.9
Victoria	426,086	39,405	3.7	1.1	1.7	0.8
Walker	227,230	49,445	22.2	6.3	10.4	5.5
Waller	253,194	51,057	25.8	6.3	14.4	5.2
Ward	405,790	81,587	5.1	0.7	1.4	3.0
Washington	320,184	69,860	34.0	10.6	13.9	9.6
Webb	1,844,858	201,959	8.8	1.6	0.6	6.6
Wharton	535,305	61,951	27.7	5.5	16.2	6.0
Wheeler	529,151	93,714	17.5	5.8	5.8	5.9
Wichita	370,302	61,354	23.9	5.2	12.3	6.3
Wilbarger	620,442	112,258	21.9	2.1	2.7	17.0
Willacy	317,922	25,938	13.0	3.8	4.6	4.7
Williamson	559,261	77,654	33.5	9.8	16.5	7.3
Wilson	433,728	77,885	31.2	11.0	12.6	7.6
Winkler	489,230	110,603	31.4	8.7	5.4	17.4
Wise	513,946	104,855	41.7	13.3	18.3	10.0
Wood	210,149	19,537	33.6	10.9	16.5	6.1
Yoakum	517,724	71,593	33.6	7.0	19.8	6.8
Young	574,982	75,604	23.9	7.2	10.7	6.0
Zapata	437,918	60,255	33.3	10.3	17.2	5.7
Zavala	729,078	100,393	18.4	5.8	3.5	9.2

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Table C. **Summary of Coverage, Nonresponse, and Misclassification Adjustments by County: 2017** (continued)

[For meaning of abbreviations and symbols, see introductory text.]

Geographic area	Total (number)	Standard error	Adjustment as percent of total	Percent of total adjustment from coverage	Percent of total adjustment from nonresponse	Percent of total adjustment from misclassification
SALES ($1,000)						
State Total						
Texas	24,924,041	417,773	14.1	3.9	6.1	4.1
Counties						
Anderson	92,943	21,376	34.0	6.7	21.1	6.3
Andrews	10,615	3,275	19.6	3.9	8.3	7.4
Angelina	61,409	12,051	35.8	21.1	3.5	11.2
Aransas	1,938	188	4.4	1.4	1.3	1.6
Archer	72,439	9,195	21.3	5.8	11.1	4.4
Armstrong	49,316	6,026	10.7	3.8	5.1	1.8
Atascosa	74,287	4,417	11.6	5.0	3.6	3.0
Austin	33,148	6,195	30.8	8.4	13.3	9.0
Bailey	357,018	17,917	8.5	2.2	3.1	3.3
Bandera	6,940	1,053	24.6	10.8	8.3	5.5
Bastrop	44,650	4,072	36.8	9.0	19.7	8.1
Baylor	53,748	8,666	21.2	1.9	12.5	6.7
Bee	37,704	5,985	25.0	5.0	15.8	4.2
Bell	77,032	13,583	15.3	1.4	12.3	1.6
Bexar	67,877	3,257	9.5	6.4	1.5	1.6
Blanco	16,987	1,560	17.3	8.1	4.4	4.7
Borden	28,788	6,000	26.0	2.7	19.5	3.8
Bosque	45,059	9,922	23.3	6.6	11.0	5.7
Bowie	60,121	5,590	24.6	4.4	14.9	5.3
Brazoria	79,526	4,471	18.6	5.6	8.5	4.6
Brazos	91,638	15,029	10.9	1.0	8.3	1.7
Brewster	16,309	2,693	9.4	0.8	5.3	3.3
Briscoe	36,608	5,584	32.3	5.6	17.9	8.8
Brooks	26,242	1,484	3.3	1.1	0.2	2.0
Brown	45,971	6,267	11.1	3.1	5.5	2.6
Burleson	58,590	3,491	18.2	5.3	7.1	5.8
Burnet	14,104	3,474	30.1	8.1	15.7	6.2
Caldwell	53,638	4,351	18.8	7.7	3.7	7.4
Calhoun	32,145	4,462	16.8	4.0	8.3	4.5
Callahan	31,240	6,819	-221.7	-35.3	-146.7	-39.7
Cameron	122,554	10,198	24.5	4.8	16.2	3.5
Camp	114,192	29,508	12.7	4.0	5.2	3.5
Carson	91,828	22,689	32.2	3.0	25.8	3.4
Cass	53,444	4,384	29.5	5.9	18.1	5.4
Castro	1,121,596	25,829	5.6	1.9	0.9	2.8
Chambers	19,252	2,947	22.0	4.4	12.0	5.5
Cherokee	115,692	9,135	16.7	8.1	4.8	3.8
Childress	27,236	2,388	-1.1	-0.3	-0.4	-0.4
Clay	55,650	5,787	19.2	2.6	12.6	4.0
Cochran	87,621	14,962	36.9	3.2	30.2	3.5
Coke	7,840	869	27.3	12.0	5.6	9.7
Coleman	41,202	6,507	28.7	8.3	8.2	12.2
Collin	66,828	7,167	15.0	4.0	4.9	6.1
Collingsworth	39,726	7,612	23.8	5.4	14.0	4.3
Colorado	70,991	11,255	21.5	4.1	12.5	4.9
Comal	9,611	2,421	38.6	12.3	17.6	8.6
Comanche	173,264	5,989	7.5	2.7	2.8	2.0
Concho	28,120	2,535	18.8	5.1	8.8	4.9
Cooke	53,831	8,014	30.7	4.4	20.1	6.3
Coryell	36,276	3,718	18.9	2.8	13.5	2.7
Cottle	27,736	915	-0.1	-0.0	-0.1	-0.1
Crane	1,866	267	9.6	2.7	0.7	6.2
Crockett	15,382	3,712	11.7	1.9	5.5	4.3
Crosby	86,903	10,122	18.9	1.8	15.2	1.9
Culberson	15,897	2,830	12.0	2.7	5.3	4.1
Dallam	634,925	40,818	11.6	5.6	1.4	4.5
Dallas	29,781	5,289	11.9	6.0	3.0	2.9
Dawson	121,296	15,100	21.3	1.8	16.8	2.7
Deaf Smith	1,638,794	116,402	2.6	0.5	0.6	1.5
Delta	36,327	2,752	12.8	3.6	4.5	4.8
Denton	123,210	7,955	10.6	2.8	5.3	2.5
DeWitt	38,684	6,333	19.5	4.5	10.1	4.9
Dickens	26,857	2,510	19.7	2.2	10.6	6.8
Dimmit	28,456	1,712	4.0	0.8	0.2	2.9
Donley	94,156	6,054	4.1	1.8	0.2	2.2
Duval	10,998	1,889	20.1	7.7	5.0	7.5
Eastland	23,519	2,003	27.8	7.3	14.0	6.6
Ector	3,382	682	37.2	17.8	4.5	14.9
Edwards	10,932	1,175	22.1	3.8	10.6	7.6
Ellis	73,147	13,430	28.5	6.8	14.8	6.9
El Paso	46,739	4,656	9.1	1.1	7.2	0.9
Erath	312,277	7,532	8.1	3.7	2.6	1.8
Falls	157,940	9,471	16.9	2.9	8.4	5.7
Fannin	86,292	7,931	21.5	5.3	10.7	5.5
Fayette	47,382	4,805	25.7	8.0	10.0	7.7
Fisher	35,739	9,612	25.0	2.0	20.8	2.2
Floyd	195,953	19,482	17.3	4.0	10.6	2.7
Foard	14,940	1,529	12.4	3.9	3.8	4.7
Fort Bend	85,013	22,930	26.3	4.8	18.5	3.0
Franklin	134,096	18,856	44.5	6.8	28.0	9.7
Freestone	68,131	(H)	47.8	2.7	40.5	4.6
Frio	124,447	13,274	10.5	1.5	7.0	1.9
Gaines	188,793	118,876	9.5	0.6	7.8	1.0
Galveston	9,233	1,684	16.1	5.7	7.5	3.0

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Table C. **Summary of Coverage, Nonresponse, and Misclassification Adjustments by County: 2017** (continued)

[For meaning of abbreviations and symbols, see introductory text.]

Geographic area	Total (number)	Standard error	Adjustment as percent of total	Percent of total adjustment from coverage	Percent of total adjustment from nonresponse	Percent of total adjustment from misclassification
SALES ($1,000) - Con.						
Counties - Con.						
Garza	22,122	4,105	-10.3	-1.5	-6.1	-2.6
Gillespie	31,211	2,547	28.3	9.7	10.4	8.3
Glasscock	50,645	3,860	34.5	9.4	17.3	7.8
Goliad	17,661	3,277	33.6	8.0	19.4	6.1
Gonzales	560,829	13,822	10.8	4.3	1.9	4.6
Gray	154,621	7,985	3.9	0.6	2.3	1.0
Grayson	66,171	8,516	33.0	9.8	17.2	6.0
Gregg	4,104	1,419	52.3	15.8	23.2	13.3
Grimes	47,509	9,903	26.0	4.4	16.8	4.8
Guadalupe	73,587	11,154	74.2	15.0	48.7	10.5
Hale	411,704	6,605	7.7	2.5	3.5	1.7
Hall	56,407	9,990	25.1	2.3	20.6	2.3
Hamilton	62,025	5,395	15.5	5.0	6.4	4.1
Hansford	737,416	17,013	1.8	0.8	0.2	0.8
Hardeman	17,996	1,628	13.7	3.8	6.6	3.3
Hardin	4,694	1,238	17.1	7.3	6.4	3.4
Harris	50,612	6,126	20.2	7.1	9.3	3.8
Harrison	15,835	1,818	26.7	7.7	13.7	5.3
Hartley	1,221,670	41,885	3.5	1.9	0.3	1.3
Haskell	54,318	6,955	21.0	4.8	9.3	6.9
Hays	21,751	1,856	17.1	7.5	4.7	4.9
Hemphill	138,890	5,068	4.4	1.7	0.9	1.8
Henderson	40,183	6,210	22.4	3.6	13.9	4.9
Hidalgo	311,030	62,170	23.2	4.8	14.7	3.8
Hill	114,001	10,505	24.1	7.1	11.7	5.3
Hockley	92,021	14,551	23.1	1.9	19.3	1.9
Hood	18,943	4,006	20.0	7.3	6.9	5.8
Hopkins	253,738	90,806	30.1	4.9	19.6	5.6
Houston	64,518	9,739	23.4	6.6	9.4	7.4
Howard	26,866	20,311	19.2	0.2	16.0	3.0
Hudspeth	17,404	3,864	15.3	4.6	1.4	9.4
Hunt	55,313	5,697	31.2	11.3	12.4	7.6
Hutchinson	44,912	881	-0.7	-0.2	-0.4	-0.2
Irion	9,275	6,031	29.5	3.9	20.8	4.8
Jack	23,176	4,493	17.2	2.9	9.0	5.4
Jackson	84,989	14,130	20.3	4.4	12.2	3.6
Jasper	9,140	1,279	17.5	10.0	3.4	4.0
Jeff Davis	29,287	2,391	0.2	(Z)	(Z)	0.2
Jefferson	32,317	6,198	16.4	5.6	5.4	5.4
Jim Hogg	10,447	3,630	17.3	1.8	4.9	10.6
Jim Wells	121,640	7,943	6.2	3.3	0.7	2.2
Johnson	57,850	20,440	35.1	7.5	22.8	4.8
Jones	41,490	4,417	24.3	5.3	14.7	4.4
Karnes	29,436	2,526	20.4	5.3	9.3	5.9
Kaufman	57,063	9,396	38.1	13.4	12.7	12.0
Kendall	12,440	1,956	42.7	16.7	14.4	11.6
Kenedy	19,705	1,499	0.5	0.1	(Z)	0.4
Kent	9,866	639	-3.8	-0.8	-1.2	-1.8
Kerr	9,326	1,710	30.8	11.9	10.7	8.2
Kimble	10,852	1,061	40.0	14.8	13.1	12.1
King	13,766	1,395	0.2	(Z)	(Z)	0.2
Kinney	5,044	297	26.8	9.7	6.6	10.4
Kleberg	52,783	5,108	9.9	0.8	0.4	8.7
Knox	60,529	59,616	25.9	1.4	20.5	4.0
Lamar	73,439	8,665	22.0	7.2	8.4	6.4
Lamb	537,317	16,664	17.1	2.9	10.0	4.2
Lampasas	18,440	4,425	15.7	3.1	8.7	3.9
La Salle	6,298	1,418	25.6	6.6	10.4	8.6
Lavaca	50,548	4,119	23.4	7.0	10.0	6.4
Lee	56,943	6,050	14.7	4.1	5.9	4.6
Leon	169,404	17,163	22.0	7.4	7.1	7.5
Liberty	29,949	2,550	16.7	4.5	7.0	5.2
Limestone	66,257	31,427	30.2	3.5	20.0	6.7
Lipscomb	79,296	7,610	20.8	2.7	12.1	6.0
Live Oak	19,451	4,646	20.3	4.2	12.6	3.5
Llano	15,725	2,016	30.0	10.9	7.9	11.2
Loving	(D)	(D)	(D)	(D)	(D)	(D)
Lubbock	219,469	18,939	19.3	3.2	12.9	3.3
Lynn	111,433	18,849	32.9	3.0	27.3	2.6
McCulloch	22,491	2,420	34.4	8.3	12.8	13.3
McLennan	179,666	14,397	17.3	6.0	7.4	3.9
McMullen	8,326	1,933	27.4	4.0	10.8	12.6
Madison	124,061	13,316	11.0	3.2	5.7	2.1
Marion	5,886	1,672	13.4	2.5	7.3	3.6
Martin	54,298	7,341	36.0	2.5	31.3	2.2
Mason	21,679	1,123	28.4	7.7	12.3	8.4
Matagorda	124,216	15,897	20.2	3.7	13.1	3.4
Maverick	42,964	2,529	3.9	0.7	1.1	2.1
Medina	93,908	6,873	17.7	4.9	6.8	6.0
Menard	9,073	1,454	24.2	6.6	8.9	8.7
Midland	16,339	7,678	34.7	7.0	22.3	5.4
Milam	129,518	12,488	19.0	7.2	5.6	6.2
Mills	30,899	3,863	13.8	2.3	7.5	4.0
Mitchell	21,742	2,716	7.4	1.7	3.4	2.3
Montague	33,416	2,241	23.7	5.9	12.1	5.7
Montgomery	25,765	12,144	14.8	2.9	9.5	2.5
Moore	478,075	13,533	2.8	1.0	0.5	1.3
Morris	44,162	5,486	39.4	14.6	10.3	14.4

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Table C. **Summary of Coverage, Nonresponse, and Misclassification Adjustments by County: 2017** (continued)

[For meaning of abbreviations and symbols, see introductory text.]

Geographic area	Total (number)	Standard error	Adjustment as percent of total	Percent of total adjustment from coverage	Percent of total adjustment from nonresponse	Percent of total adjustment from misclassification
SALES ($1,000) - Con.						
Counties - Con.						
Motley	15,227	1,488	17.0	2.0	4.3	10.7
Nacogdoches	370,742	47,241	38.3	14.7	15.1	8.6
Navarro	73,306	10,336	32.1	6.8	19.6	5.7
Newton	1,587	274	35.1	17.2	7.2	10.6
Nolan	36,609	6,835	25.6	5.7	14.0	5.9
Nueces	161,022	9,317	5.2	0.7	3.5	0.9
Ochiltree	349,057	24,167	4.7	0.9	1.1	2.6
Oldham	156,012	6,427	2.1	0.4	(Z)	1.6
Orange	4,967	1,759	9.3	1.2	6.7	1.4
Palo Pinto	43,219	17,904	33.5	3.5	24.3	5.7
Panola	100,720	69,084	7.8	2.6	3.2	2.0
Parker	65,043	6,978	27.0	10.9	9.5	6.6
Parmer	893,341	13,099	22.9	9.7	4.3	8.8
Pecos	46,165	2,689	4.4	0.7	0.1	3.6
Polk	6,831	1,071	31.2	12.6	10.2	8.4
Potter	24,831	1,451	5.1	1.5	0.3	3.4
Presidio	47,963	2,321	8.1	3.6	0.3	4.1
Rains	22,759	3,807	18.1	4.5	10.0	3.6
Randall	479,464	17,701	4.5	3.0	0.6	0.9
Reagan	18,203	6,885	27.8	2.7	19.0	6.0
Real	1,263	280	21.2	10.1	3.5	7.6
Red River	94,037	5,997	26.5	7.2	11.7	7.6
Reeves	10,891	1,045	12.4	2.0	3.1	7.3
Refugio	35,912	3,325	4.6	0.8	2.4	1.4
Roberts	18,300	2,206	32.3	6.0	2.7	23.6
Robertson	158,143	14,550	21.5	6.6	8.5	6.4
Rockwall	7,830	2,981	30.1	10.8	11.9	7.5
Runnels	53,434	10,639	30.7	4.6	23.2	2.9
Rusk	100,157	16,129	47.9	13.4	22.7	11.8
Sabine	17,715	1,704	17.1	6.4	3.8	6.9
San Augustine	56,676	10,165	17.4	9.5	2.0	6.0
San Jacinto	7,190	806	33.4	14.4	9.5	9.5
San Patricio	131,342	12,983	18.6	3.6	11.6	3.3
San Saba	35,823	4,791	28.2	7.7	11.7	8.9
Schleicher	17,790	3,558	19.4	3.9	10.1	5.4
Scurry	45,152	5,429	19.0	4.1	11.6	3.3
Shackelford	16,609	2,599	16.8	2.4	9.7	4.7
Shelby	467,557	38,306	31.7	9.1	16.3	6.4
Sherman	838,058	29,659	1.5	1.1	0.1	0.3
Smith	53,604	4,134	22.5	9.6	6.8	6.0
Somervell	4,099	1,196	17.5	2.2	13.7	1.6
Starr	47,230	6,721	13.8	3.6	3.8	6.4
Stephens	10,624	1,136	30.6	11.6	7.7	11.2
Sterling	7,699	275	2.0	0.5	0.2	1.3
Stonewall	15,543	4,899	41.5	18.8	6.5	16.1
Sutton	10,350	578	13.3	3.1	3.4	6.8
Swisher	623,921	16,587	3.7	1.9	0.9	0.9
Tarrant	29,394	4,592	7.5	2.8	2.7	1.9
Taylor	31,541	3,185	24.4	9.3	7.6	7.5
Terrell	4,191	723	16.3	2.3	7.5	6.5
Terry	136,944	36,630	27.6	2.6	20.7	4.2
Throckmorton	27,260	2,285	11.7	2.7	1.2	7.8
Titus	149,293	22,024	51.1	13.7	26.6	10.8
Tom Green	100,030	4,326	3.2	1.1	1.4	0.7
Travis	28,109	9,265	18.0	5.4	7.5	5.1
Trinity	8,228	1,609	30.9	8.4	13.9	8.7
Tyler	14,886	1,289	13.1	6.0	2.9	4.1
Upshur	40,713	4,128	29.5	6.8	17.0	5.7
Upton	19,063	5,638	38.0	10.2	6.6	21.2
Uvalde	87,101	6,070	10.7	2.3	1.3	7.1
Val Verde	9,446	1,386	17.8	4.5	4.8	8.5
Van Zandt	104,602	11,016	10.5	3.6	4.4	2.5
Victoria	58,375	11,833	9.2	1.8	6.1	1.4
Walker	33,795	3,930	9.6	2.4	4.8	2.4
Waller	102,369	18,721	14.3	3.7	8.1	2.5
Ward	(D)	(D)	(D)	(D)	(D)	(D)
Washington	35,615	2,172	23.6	8.1	9.1	6.3
Webb	28,395	3,071	8.7	1.3	0.6	6.7
Wharton	208,540	32,740	23.9	4.3	16.7	2.9
Wheeler	70,596	3,257	4.8	1.8	1.8	1.2
Wichita	33,765	6,132	25.7	4.2	15.5	6.0
Wilbarger	51,895	13,027	31.6	3.0	16.2	12.3
Willacy	88,081	8,275	16.4	3.0	9.4	4.1
Williamson	114,923	14,147	29.3	5.1	17.9	6.3
Wilson	68,632	8,492	20.0	6.4	7.8	5.7
Winkler	3,424	187	6.1	1.4	0.3	4.3
Wise	46,270	9,362	39.1	10.1	19.8	9.2
Wood	127,541	9,437	38.1	10.5	21.4	6.2
Yoakum	100,202	17,088	29.8	2.7	23.9	3.2
Young	21,694	2,279	27.0	6.8	13.4	6.8
Zapata	6,349	1,408	30.8	8.0	18.2	4.5
Zavala	66,626	15,951	22.0	2.8	13.1	6.2

Table D. **American Indian or Alaska Native Producers: 2017**

[For meaning of abbreviations and symbols, see introductory text.]

Geographic area	American Indian or Alaska Native farm producers		
	Total	Individually reported [1]	Other [2]
State Total			
Texas	5,663	5,663	-
Counties			
Anderson	26	26	-
Angelina	19	19	-
Archer	6	6	-
Armstrong	8	8	-
Atascosa	39	39	-
Austin	26	26	-
Bailey	4	4	-
Bandera	25	25	-
Bastrop	41	41	-
Baylor	2	2	-
Bee	21	21	-
Bell	67	67	-
Bexar	52	52	-
Blanco	34	34	-
Bosque	37	37	-
Bowie	60	60	-
Brazoria	85	85	-
Brazos	22	22	-
Brewster	19	19	-
Briscoe	5	5	-
Brown	30	30	-
Burleson	20	20	-
Burnet	44	44	-
Caldwell	38	38	-
Calhoun	6	6	-
Callahan	16	16	-
Cameron	29	29	-
Camp	16	16	-
Carson	8	8	-
Cass	26	26	-
Castro	4	4	-
Chambers	14	14	-
Cherokee	48	48	-
Childress	2	2	-
Clay	22	22	-
Cochran	20	20	-
Coke	7	7	-
Coleman	46	46	-
Collin	104	104	-
Collingsworth	2	2	-
Colorado	20	20	-
Comal	23	23	-
Comanche	35	35	-
Concho	6	6	-
Cooke	58	58	-
Coryell	43	43	-
Crockett	6	6	-
Crosby	4	4	-
Culberson	2	2	-
Dallam	7	7	-
Dallas	58	58	-
Dawson	1	1	-
Deaf Smith	14	14	-
Delta	18	18	-
Denton	75	75	-
DeWitt	8	8	-
Dickens	13	13	-
Dimmit	12	12	-
Donley	2	2	-
Duval	16	16	-
Eastland	29	29	-
Ector	5	5	-
Edwards	9	9	-
Ellis	71	71	-
El Paso	21	21	-
Erath	68	68	-
Falls	35	35	-
Fannin	56	56	-
Fayette	45	45	-
Fisher	6	6	-
Floyd	3	3	-
Foard	6	6	-
Fort Bend	9	9	-
Franklin	9	9	-
Freestone	19	19	-
Frio	4	4	-
Galveston	27	27	-
Garza	2	2	-
Gillespie	34	34	-
Goliad	14	14	-
Gonzales	18	18	-
Gray	14	14	-
Grayson	158	158	-

Geographic area	American Indian or Alaska Native farm producers		
	Total	Individually reported [1]	Other [2]
Counties - Con.			
Gregg	5	5	-
Grimes	55	55	-
Guadalupe	36	36	-
Hale	9	9	-
Hall	4	4	-
Hamilton	38	38	-
Hansford	2	2	-
Hardeman	1	1	-
Hardin	16	16	-
Harris	24	24	-
Harrison	32	32	-
Hartley	5	5	-
Haskell	8	8	-
Hays	47	47	-
Hemphill	7	7	-
Henderson	49	49	-
Hidalgo	44	44	-
Hill	30	30	-
Hockley	8	8	-
Hood	32	32	-
Hopkins	50	50	-
Houston	14	14	-
Howard	8	8	-
Hudspeth	7	7	-
Hunt	162	162	-
Hutchinson	5	5	-
Irion	9	9	-
Jack	15	15	-
Jackson	18	18	-
Jasper	10	10	-
Jeff Davis	1	1	-
Jefferson	24	24	-
Jim Hogg	14	14	-
Jim Wells	3	3	-
Johnson	121	121	-
Jones	14	14	-
Karnes	28	28	-
Kaufman	136	136	-
Kendall	26	26	-
Kenedy	2	2	-
Kent	2	2	-
Kerr	17	17	-
Kimble	9	9	-
Kinney	6	6	-
Kleberg	8	8	-
Knox	2	2	-
Lamar	41	41	-
Lamb	6	6	-
Lampasas	34	34	-
La Salle	21	21	-
Lavaca	13	13	-
Lee	23	23	-
Leon	34	34	-
Liberty	54	54	-
Limestone	22	22	-
Lipscomb	11	11	-
Live Oak	35	35	-
Llano	22	22	-
Lubbock	20	20	-
Lynn	10	10	-
McCulloch	25	25	-
McLennan	64	64	-
McMullen	4	4	-
Madison	16	16	-
Marion	5	5	-
Martin	1	1	-
Mason	11	11	-
Matagorda	18	18	-
Maverick	4	4	-
Medina	26	26	-
Menard	8	8	-
Midland	6	6	-
Milam	59	59	-
Mills	5	5	-
Mitchell	10	10	-
Montague	33	33	-
Montgomery	15	15	-
Moore	7	7	-
Morris	8	8	-
Motley	2	2	-
Nacogdoches	16	16	-
Navarro	80	80	-
Newton	8	8	-
Nolan	5	5	-
Nueces	10	10	-
Ochiltree	7	7	-
Oldham	4	4	-

See footnote(s) at end of table.

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Table D. **American Indian or Alaska Native Producers: 2017** (continued)

[For meaning of abbreviations and symbols, see introductory text.]

Geographic area	American Indian or Alaska Native farm producers			Geographic area	American Indian or Alaska Native farm producers		
	Total	Individually reported [1]	Other [2]		Total	Individually reported [1]	Other [2]
Counties - Con.				**Counties** - Con.			
Orange	20	20	-	Stephens	10	10	-
Palo Pinto	35	35	-	Sterling	3	3	-
Panola	6	6	-	Stonewall	4	4	-
Parker	148	148	-	Sutton	12	12	-
Parmer	6	6	-	Swisher	18	18	-
Pecos	8	8	-	Tarrant	23	23	-
Polk	18	18	-	Taylor	21	21	-
Potter	5	5	-	Terry	24	24	-
Presidio	9	9	-	Throckmorton	2	2	-
Rains	34	34	-	Titus	19	19	-
Randall	20	20	-	Tom Green	9	9	-
Reagan	1	1	-	Travis	33	33	-
Real	2	2	-	Trinity	10	10	-
Red River	72	72	-	Tyler	11	11	-
Reeves	26	26	-	Upshur	47	47	-
Refugio	6	6	-	Uvalde	3	3	-
Roberts	4	4	-	Val Verde	12	12	-
Robertson	39	39	-	Van Zandt	141	141	-
Rockwall	3	3	-	Victoria	20	20	-
Runnels	15	15	-	Walker	28	28	-
Rusk	16	16	-	Waller	19	19	-
Sabine	14	14	-	Washington	23	23	-
San Augustine	13	13	-	Webb	21	21	-
San Jacinto	23	23	-	Wharton	21	21	-
San Patricio	9	9	-	Wheeler	16	16	-
San Saba	34	34	-	Wichita	46	46	-
Schleicher	1	1	-	Wilbarger	1	1	-
Scurry	17	17	-	Willacy	2	2	-
Shackelford	4	4	-	Williamson	68	68	-
Shelby	18	18	-	Wilson	36	36	-
Sherman	2	2	-	Wise	74	74	-
Smith	68	68	-	Wood	16	16	-
Somervell	6	6	-	Yoakum	2	2	-
Starr	2	2	-	Young	15	15	-

[1] Data were collected for a maximum of four producers per farm.
[2] Data represent American Indian or Alaska Native farm or ranch producers on reservations who did not report individually. Data obtained by reservation officials.