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2012 AGRICULTURAL DATA IN PERSPECTIVE

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The 2012 Census of Agriculture provides a wealth of statistics. However, because there were drought conditions in much of South Dakota during 2012, the information in the Census may not reflect normal conditions in agriculture. That is why it is beneficial to compare information obtained from the Census to other sources of data. In practice comparing data from two different sources is often difficult. For example, information about crops from other sources is often reported for a crop year that begins at harvest and ends before the next year's harvest, and thus spans two calendar years.

We seek to highlight some of the disparities in crop data between calendar years, crop years, and 2012. Many of the disparities were most apparent for the corn crop. Crop and livestock sales are the most common measure of agriculture activity and both were affected by drought conditions in 2012. The lower crop sales were partially offset by higher crop insurance payments, which are not normally equated to sales.

Sales and Government Payments

There are a variety of sources that provide information about conditions in the agricultural sector. The Census gives a formal survey measurement of sales. The National Agricultural Statistics Service (NASS)

annually estimates production, the pace of marketings and stocks¹. The Economic Research Service (ERS) derives an estimate of state-level sales from production and stocks figures in value added tables². Those figures are also refined by the Bureau of Economic Analysis (BEA) in farm income and expenses tables and further allocated at the county level³. The currently available allocations from ERS and BEA were released prior to the 2012 Census. This project is part of a larger effort to assess the role of agriculture at the county level.⁴

In the 2012 Census, South Dakota farmers reported agricultural sales of \$10.2 billion. Of this total, crops contributed \$6.1 billion and livestock provided \$4.1 billion. For comparison, NASS reported that the market value of all field and miscellaneous crops produced in 2012 was \$7.6 billion in South Dakota. This estimate is based on average crop prices and so does not reflect actual revenue levels that farmers might receive as a result of market timing and also does not incorporate on-farm feed use of any crops.

Sales are a major area where the drought would have had an impact. The ERS estimated crop sales at \$6.4 billion and livestock sales at \$3.6 billion in 2012. The BEA estimated crops sales at \$6.5 billion and livestock sales at \$4.2 billion in 2012. Both also estimated other farm income at \$1.4 billion in 2012, which reflected a sharp increase over 2011 levels because of crop

¹ NASS reports and statistics are available at www.nass.usda.gov and in published sources.

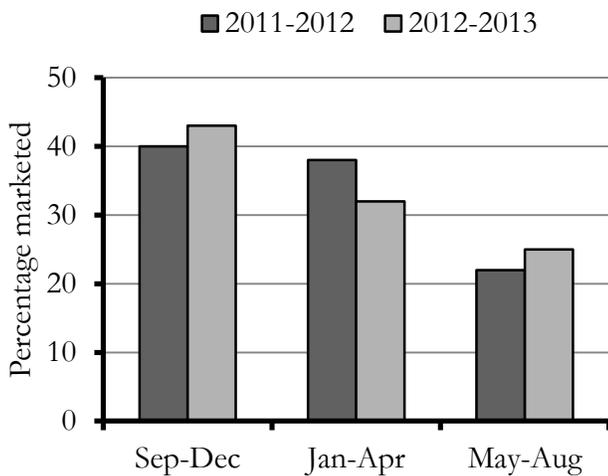
² ERS documentation is available at www.ers.usda.gov and in Park et al. (2011).

³ BEA documentation is available at www.bea.gov and in Lenze (2013).

⁴ The larger project is partially supported by the South Dakota Department of Agriculture.

insurance indemnity payments. The Census reveals lower crop sales than earlier expectations would have suggested. Livestock sales totals also differ, but this may be caused by the way the ERS accounts for the part of sales that does not leave the state. The purchased livestock totals for 2012 are similar for the BEA and the Census.

Part of the discrepancy in crops data from different sources is timing. For corn, NASS collects the monthly percent of crops sold, and aggregates estimates to a state-level figure. These monthly marketings can be combined into 4-month intervals to summarize the relation between production and sales during a calendar year. The value of corn produced in 2011 was \$3.9 billion in South Dakota, and in 2012 it was \$3.6 billion. Some of the corn was used as feed. Regardless, sales in calendar year 2012 consisted of about 60 percent of the crop produced in 2011 and 43 percent of the crop produced in 2012 (figure 1). In comparison, the Census has corn sales of \$3.1 billion.



Note: Aggregated from NASS data.

Figure 1. South Dakota corn marketings

In the 2012 Census, South Dakota farmers reported receiving government payments in the amount of \$283,797,000. This compares closely to the 2012 ERS estimate of \$330,831,000. The ERS totals show a fairly even split between direct payments and conservation program payments. Note that the total excludes any crop insurance payments or premium subsidies.

Insurance

Another place where both drought and timing concerns show up is in insurance statistics. In the Census, crop and livestock insurance payments totaled \$567 million. The large insurance payments were expected given the extreme drought-related crop losses during 2012 in the southeastern part of the state. Separate from the Census, the Risk Management Agency (RMA) reports that the total indemnity payments for crop year 2012 were \$1.1 billion, exclusive of livestock. The importance of the indemnity payments following the 2012 drought were documented by Lubben and Thompson (2013). In comparison, the five-year average of indemnities at the state level was \$363 million. Thus, the drought impact on insurance payouts was significant.

Corn was the primary driver of insurance payouts, with indemnity payments totaling \$777 million for the crop year. The payments were large because yields in many areas were sharply affected by a lack of moisture and because the type of coverage (Revenue Protection or RP) increased with higher prices. RP is favored by those hedging the crop and using it for feed as it covers the cost of replacing needed bushels.

The disparity in the insurance payments between the Census and the RMA are substantial. Insurance payments received during calendar year 2012 may reflect crop losses of both the 2011 and 2012 crop years. RMA periodically reports county level totals during the claim year by crop year. By separating out the likely payments associated with a given crop year, we obtain an estimate for payments received during the calendar year, which is comparable to the Census figures. While this lowers the amount received in 2012 to \$938 million, it still exceeds the Census total for the same year. There are two possible explanations for the discrepancy. First, sampling errors and misattributed totals explain some differences. Second, farmers are the only ones receiving indemnity payments reported by the Census -- landowners could have shares insured and received payments and lienholders (e.g., creditors) could also have received payments.

The pattern of the indemnity payments matches the severity of the drought conditions and lower crop values at the county level (figure 2). Northern counties along the James River Valley received payments largely from the 2011 crop year. The largest payments in 2012 were in the southeast part of the state. Hutchinson County had the largest indemnity payments exceeding \$100 million for the calendar year. Payment levels exceeded \$35 million in Bon Homme, Charles Mix, Clay, Lincoln, McCook, Turner and Yankton counties.

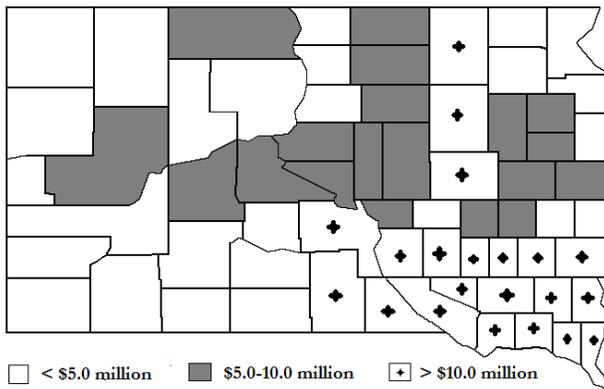
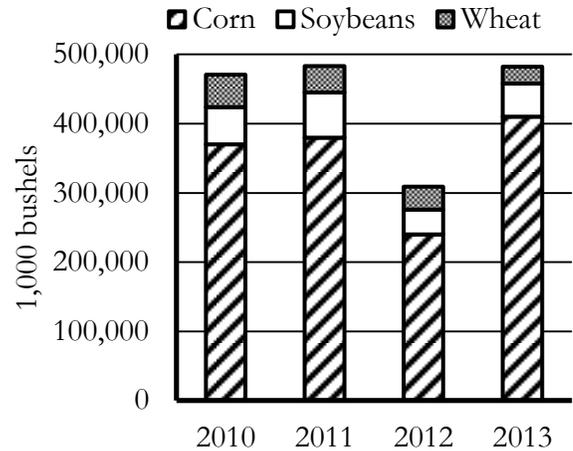


Figure 2. 2012 indemnity payments by county

Inventory Adjustments

A major corrective factor provided by the ERS is the adjustment of inventory levels. These are reported for livestock, but must be computed for crops. NASS reports the state-level inventories of major crops on a quarterly basis. The change in on-farm stocks of corn, soybeans and wheat shows another impact of the 2012 drought conditions. From December 1, 2011 to December 1, 2012, there was a large drawdown in stocks in South Dakota, especially of corn (figure 3), due to increased feed demand and much lower production. The ERS reported an inventory adjustment for all crops of -\$769 million for 2012. Because stocks for feed use and normal delivery flows resumed in 2013, there were fewer bushels for sale during the year.



Source: USDA-NASS

Figure 3. On-farm grain stocks

What Normal May Look Like

The Census information likely understates normal production levels in many counties that produce corn. Sales in the Census from southeastern South Dakota counties reflect below-normal levels as drought conditions reduced yields. Another effect of the drought was on the livestock side. At the state level, the Census-reported amount spent on purchased feed was \$1.3 billion in 2012, more than double the \$0.6 billion preliminary estimates made by both ERS and BEA.

To see the more typical distribution of crop values, consider the yield pattern for corn. One measure to determine the relative productivity in different counties is to use the proven yields from crop insurance data. These are not available directly, but can be computed from county-level statistics from RMA. In 2012 it was common for corn growers to purchase coverage at the 75% level using RP. Thus, by only considering the 75% RP policies for each county, we are able to determine the implied proven yield. For each county, the insurance guarantee was divided by the number of acres and coverage price, and then divided by 0.75 to obtain the proven yield. As expected, proven yields were highest in eastern South Dakota counties and declined as one moves west

(figure 4). Pockets of higher yields in some western counties are attributable to irrigated production.

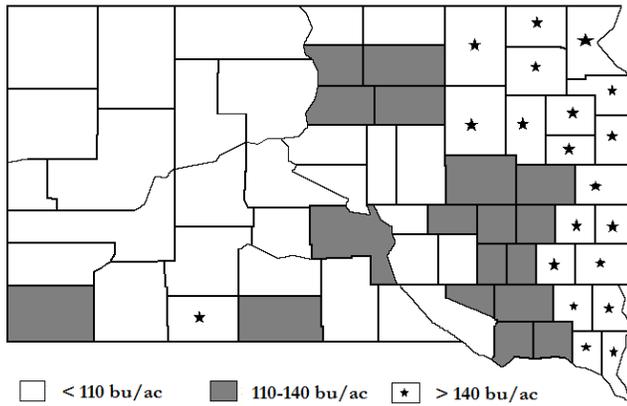


Figure 4. Implied proven corn yields

The implication of all of these discrepancies and reconciliations is to use the Census information wisely. The Census provides an excellent view of 2012, but at a point in time that was affected by drought conditions and not necessarily representative of normal production for the state. The impact is particularly pronounced at the individual county level. Unusually lower cash receipts in drought-affected counties were partially offset by high insurance indemnity payments. This outcome was verified using proven yields. As

ERS and BEA revisions occur they will likely show a more accurate picture of the revenue side for 2012, but still not show what would occur under normal weather conditions.

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