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Using FSA Acreage Data to Project NASS January Planted Acreage Estimates for Corn and Soybeans

Darrel Good and Scott Irwin

Department of Agricultural and Consumer Economics
University of Illinois

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Each year the USDA's National Agricultural Statistics Service (NASS) provides estimates of planted acreage of corn and soybeans in the U.S. These estimates provide important fundamental information about potential crop size and have important implications for the price of corn and soybeans. As a result, market participants spend considerable effort in forming expectations about the magnitude of these acreage estimates. In recent years, the USDA's Farm Service Agency (FSA) has also issued monthly reports of planted acreage to the public beginning in August based on farmer reports received and summarized to date. The usefulness of the FSA acreage data has been the subject of considerable debate. The purpose of this article is to examine the relationship between monthly FSA and final NASS acreage data to determine if and how soon in the cycle that FSA data might be useful in anticipating final NASS acreage estimates for corn and soybeans.

Background

We summarized the progression of USDA/NASS acreage estimates in the *farmdoc daily* article on [October 15, 2015](#). Briefly, that progression includes the [Prospective Plantings report](#) currently released on the last business day of March, the [Acreage report](#) released on the last business day of June, the [October Crop Production report](#), and the [Crop Production Annual Summary report](#) released in January after harvest. For soybeans, the estimate of planted acreage is sometimes revised in the [September Grain Stocks report](#) released at the end of the marketing year. Such revisions stem from a better accounting of soybean consumption during the previous year provided by the September 1 stocks estimate. In addition to these reports, acreage estimates are occasionally revised in the August *Crop Production* report. These revisions occur in years of unusual planting delays, such as in 2015, and reflect a re-survey of producers in affected areas that were surveyed for the June *Acreage* report. Finally, acreage estimates are sometimes revised in subsequent years based on the 5-year Census of Agriculture.

The estimates of planted acreage provided in March, June, and January after harvest are based primarily on acreage data collected in the NASS Agricultural Surveys (as well as area frame sampling in June), as described in the October 15, 2015 *farmdoc daily* article. NASS does not conduct a special survey for

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acreage estimates in the October *Crop Production* report, but like the earlier *Crop Production* reports in the cycle (August and September) information in the October Agricultural Survey could be used to adjust acreage estimates. In October, however, NASS does use administrative data to complement their acreage survey data. The primary administrative data used in the report are acreage data reported to the USDA's Farm Service Agency (FSA). As indicated on the [FSA website](#), "Farm Service Agency policy requires that producers participating in several programs submit an annual report regarding all cropland use on their farms." The FSA now issues monthly reports of planted acreage to the public beginning in August based on farmer reports received and summarized to date. The final report is released in January and, in theory, that data represent a complete census of acreage enrolled in the farm programs administered by the FSA. Since the vast majority of corn and soybean acreage is enrolled in farm programs that require acreage reporting, the data should be highly correlated to total planted acreage of each of those crops as estimated by NASS. Data released in October are typically complete enough to be used by NASS to adjust planted acreage estimates. It should be emphasized that administrative data are used by NASS to supplement sampling data and there are likely statistical limits on the magnitude of changes in estimates made in October. Our conversations with NASS statisticians indicate the changes are typically no more than one standard error from the previous estimate.

Still, these changes can sometimes be large enough to alter production estimates to the point they have a potential market impact. In 2015, for example, the soybean acreage estimate declined by about 1.1 million acres in October. Without a change in the yield estimate, such a change would have lowered the soybean production estimate by just over 50 million bushels, or about 1.3 percent. The market has difficulty anticipating changes in NASS acreage estimates in October since the FSA acreage data are not released to the public until after the October *Crop Production* report is released. In addition, the final NASS acreage estimate released in January can differ from the October estimate based on a combination of survey data collected in December and final FSA acreage data released in January.

Analysis

FSA planted acreage data are obviously not released early enough in the year to assist market participants in anticipating NASS corn and soybean acreage estimates in March and June. However, FSA acreage data may be quite useful in anticipating the final NASS acreage estimate released in January. Here, we examine the relationship between monthly FSA and final NASS acreage data to determine if and how soon in the cycle that FSA data might be useful in anticipating final NASS acreage estimates for corn and soybeans.

We begin by reviewing the relationship between the January FSA and NASS acreage estimates for corn and soybeans from 2007 through 2015. This time period is selected based on the availability of FSA data at the FSA website. As indicated in Tables 1 and 2, that relationship has been fairly stable over the entire period, with the exception of 2014 for corn. For corn, the January FSA acreage estimate as a percentage of the January NASS estimate (excluding 2014) ranged from 96.67 percent to 97.38 percent and averaged 96.91 percent. The relationship in 2014 was a bit of an outlier, with FSA acreage accounting for only 95.48 percent of NASS acreage. The reasons for the smaller percentage in 2014 are unknown, but likely relate to the limits that NASS places on administrative data for adjusting the survey data from the very comprehensive December Agricultural Survey. For soybeans, the January FSA acreage estimate as a percentage of the January NASS estimate for the entire time period ranged from 97.68 percent to 98.79 percent and averaged 98.44 percent. The average excluding 2014 is only marginally higher at 98.54 percent. It should be expected that FSA acreage estimates are less than NASS estimates since not all farms are enrolled in programs that require acreage reporting. The consistent relationship between FSA and NASS acreage is also not surprising since FSA acreage data are used as an input in the NASS acreage estimating process. With the exception of corn in 2014, then, FSA acreage estimates have been a good predictor of January NASS acreage estimates. The problem, of course, is that FSA acreage estimates are released after the release of the January NASS estimates.

As a result of the timing of the release of FSA and NASS acreage estimates, it is useful to examine the monthly FSA acreage estimates from August through December to see how quickly and how consistently the monthly estimates approach the January FSA estimates. Those monthly estimates are available at the FSA website for the years 2011 through 2015. Figures 1 and 2 indicate the monthly estimates as a percentage of the final estimates for each of the past five years for corn and soybeans, respectively. Not surprisingly, the August estimates represented a generally low percentage of the final estimate for both corn and soybeans each year. In addition, there has been a relatively wide range in the August estimate as a percentage of the final estimate. With the exception of 2014, the monthly estimates as a percentage of the

final estimate approached 100 percent by October, and certainly by November. August estimates were a higher percentage of the final estimate in 2011 and 2012 than in the past three years. In addition, monthly estimates approached 100 percent of the final estimate earlier in the cycle in 2011 and 2012. Still, with the exception of 2014 for corn and soybeans and 2013 for corn, the September estimate has equaled or exceeded 99 percent of the January FSA estimates. The September estimates for corn in 2013 and 2014 and soybeans in 2014 exceeded 98 percent of the January estimates. For corn, the average for the four years that excludes 2014 was 99.37 percent, with a range of only 0.81 percentage points. For soybeans, the average for the four years that excludes 2014 was 99.46 percent, with a range of only 0.64 percentage points. The September estimate appears to be a reliable indicator of the magnitude of the January FSA estimate.

Table 1. U.S. Planted Acres of Corn Estimated by NASS and Reported to FSA--2007-2015

Year	NASS	FSA	Difference	FSA/NASS
	000 ac	000 ac	000 ac	percent
2007	93,600	91,146	2,454	97.38
2008	85,982	83,394	2,588	96.99
2009	86,482	83,842	2,640	96.95
2010	88,192	85,373	2,819	96.80
2011	91,921	88,864	3,057	96.67
2012	97,155	94,070	3,085	96.82
2013	95,365	92,399	2,966	96.89
2014	90,597	86,505	4,092	95.48
2015	87,999	85,143	2,856	96.75

Note: NASS planted acreage is the January estimate released in the year after planting.

Table 2. U.S. Planted Acres of Soybeans Estimated by NASS and Reported to FSA--2007-2015

Year	NASS	FSA	Difference	FSA/NASS
	000 ac	000 ac	000 ac	percent
2007	63,631	62,857	774	98.78
2008	75,718	74,801	917	98.79
2009	77,451	76,406	1,045	98.65
2010	77,404	76,318	1,086	98.60
2011	74,976	73,773	1,203	98.40
2012	77,198	75,879	1,319	98.29
2013	76,553	75,299	1,257	98.36
2014	83,701	81,757	1,944	97.68
2015	82,650	81,370	1,280	98.45

Note: NASS planted acreage is the January estimate released in the year after planting.

Figure 1. Ratio of Preliminary to Final January FSA Estimate of U.S. Corn Planted Acreage, 2011-2015

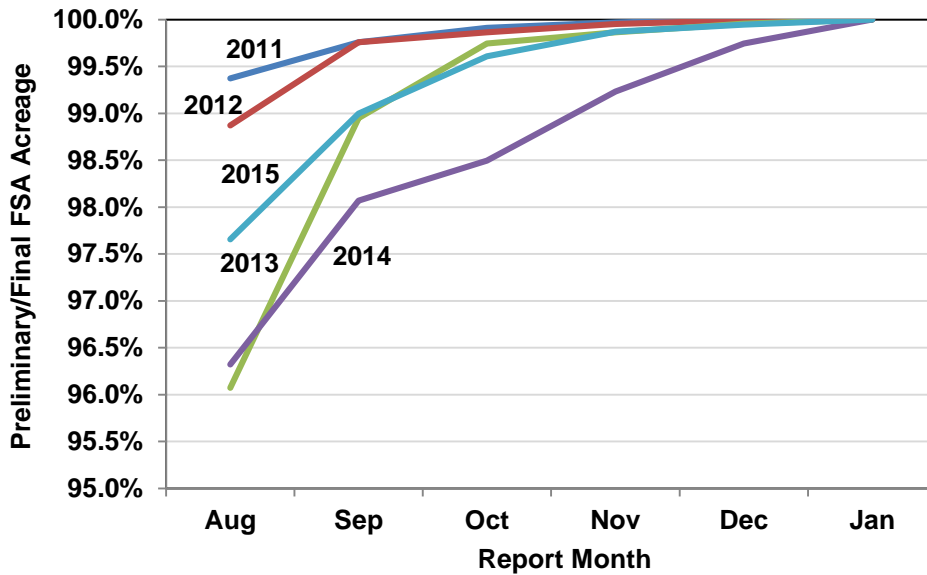
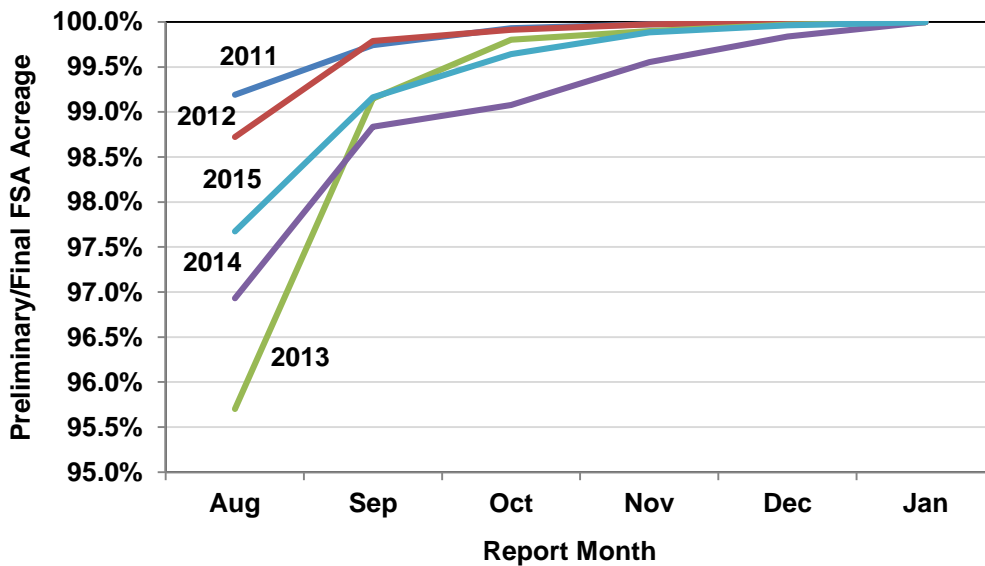
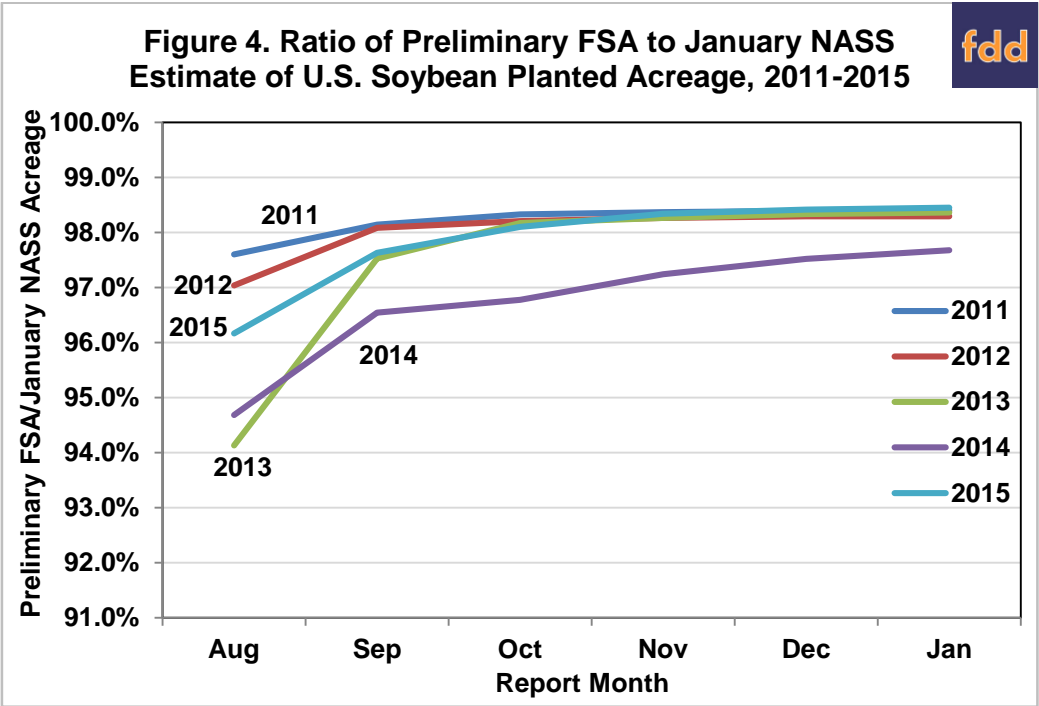
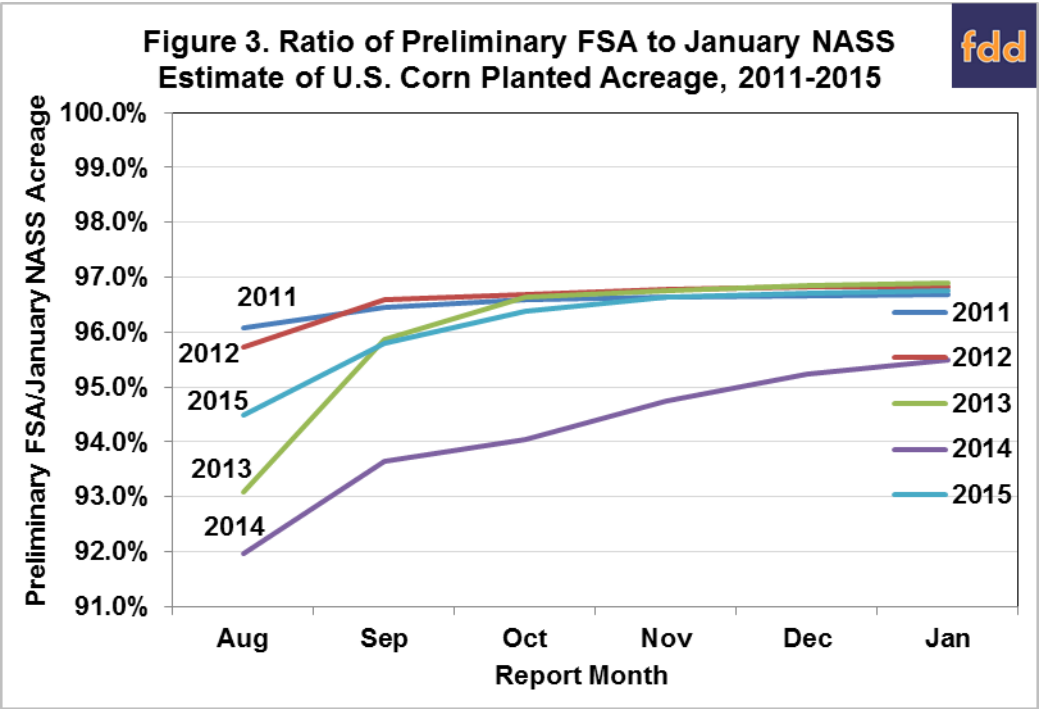


Figure 2. Ratio of Preliminary to Final January FSA Estimate of U.S. Soybean Planted Acreage, 2011-2015



Finally, as an extension of the previous analysis, we look at the recent relationship between the monthly FSA acreage estimates and the January NASS acreage estimates for corn and soybeans for each of the five years from 2011 through 2015. The patterns in Figures 3 and 4 are similar to the patterns in Figures 1 and 2 since the relationship between the January FSA and NASS estimates is fairly stable. The range in the ratio of FSA acreage estimates and January NASS estimates are relatively large in August, but narrow in September. Excluding 2014, the range is quite small from October forward. That consistent pattern supports the inclusion of FSA acreage in the NASS acreage estimates in October.



Excluding 2014, the ratio of the FSA acreage estimate to the January NASS acreage estimate has also been relatively consistent in September. For corn, the September FSA acreage estimate as a percentage of the January NASS estimate for the four years excluding 2014 averaged 96.17 percent, in a range of 95.78 percent to 96.59 percent. For soybeans, the September FSA acreage estimate as a percentage of the January NASS estimate for the four years excluding 2014 averaged 97.84 percent, in a range of 97.53 percent to 98.14 percent. Assuming that the pattern of 2014 was an outlier that will not be repeated, it appears that FSA acreage estimates as early as September provide a very good forecast of the NASS acreage estimate released in January for both corn and soybeans.

Implications

There is obvious interest in the magnitude of the January NASS estimates of planted acreage of corn and soybeans as those estimates impact final production estimates. Those estimates in turn impact the projected supply/demand balance and price prospects for the marketing year. The experience of the past five years, excluding 2014, indicates that the FSA report of planted acreage issued in September provides a reasonable forecast of the NASS estimate of planted acreage released in January. In the four years of 2011, 2012, 2013, and 2015, the September FSA estimate of planted acreage of corn averaged 96.17 percent of the NASS estimate of planted acreage released in January. The range was from 95.78 percent to 96.59 percent. The September FSA estimate of soybean acreage averaged 97.84 percent of the NASS estimate of planted acreage of soybeans released in January. The range was from 97.53 percent to 98.14 percent. With planted acreage of corn in the neighborhood of 90 million acres, the September FSA acreage estimate would project the NASS January planted acreage estimate in a range of about 0.8 million acres. Similarly, with planted acreage of soybeans near 83 million acres, the September FSA acreage estimate, would project the NASS January planted acreage estimate in a range of about 0.5 million acres. The bottom-line is that FSA planted acreage estimates provide a reasonably accurate prediction of final NASS planted acreage estimates for corn and soybeans as early as September of each crop year.

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