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## Are There Acres Missing from the USDA's *Prospective Plantings* Report?

Darrel Good and Scott Irwin

Department of Agricultural and Consumer Economics  
University of Illinois

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The USDA's *Prospective Plantings* report released on March 31 revealed that U.S. producers intend to plant 91.7 million acres of corn and 81.5 million acres of soybeans. The soybean acreage was near market expectations but the corn acreage was about a million acres less than expectations. The smaller than expected corn acreage has prompted considerable discussion about the possibility of the USDA survey undercounting total acreage and this is the reason for the "low" figure for corn. The purpose of today's post is to examine the data and see if there really is a case to be made for missing acres in this year's *Prospective Plantings* report.

The logical starting point for the analysis is the total acreage planted to principal crops in the U.S. Principal crops include planted acres of corn, sorghum, oats, barley, rye, winter wheat, durum wheat, other spring wheat, rice, soybeans, peanuts, sunflower, cotton, dry edible beans, potatoes, canola, proso millet, and sugarbeets as well as harvested acreage for hay, tobacco, and sugarcane. The total should also include double cropped acres and unharvested acreage of small grains planted as cover crops. The estimate of this overall total for 2014 from the just released *Prospective Plantings* report is 325.9 million acres, and it is based on the USDA's March Agricultural Survey of approximately 84,000 producers that was conducted between February 27 and March 18, 2014.

The estimate of intended acreage of principal crops is 1.1 million acres larger than acreage of those same crops of a year ago and the second largest in 13 years. The largest acreage of principal crops in that period was 326.3 million in 2012. Even though the planned acreage of these crops is large by recent standards, it is possible that the estimate does not account for all the available crop land in 2014. The potential for an undercount stems from two basic sources. The first is that acreage enrolled in the Conservation Reserve Program (CRP) in 2014 is about 1.7 million acres less than enrolled in 2013. Since acreage coming out of the CRP was in crop production at some time in the past, it is thought that much of that released acreage will be cropped in 2014. The second reason for a possible undercount stems from the large amount of acreage that was prevented from being planting in 2013. Producers enrolled in federal farm programs reported to the USDA's Farm Service Agency (FSA) that 8.3 million acres of crop land qualified as prevented planting acres in 2013 due to adverse weather conditions that extended beyond acceptable planting dates. Since 2007 prevented planted acres reported to FSA have ranged from 1.2 million acres

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(2012) to 9.6 million acres (2011). It was believed that producers planting intentions this year would reflect intentions to plant all acreage, that is, to have no prevented planted acreage.

It is possible that the combination of fewer acres enrolled in the CRP in 2014 and plans to plant all acreage would result in intentions for all principal crops exceeding last year's acreage by much more than 1.1 million acres. The magnitude of the potential shortfall in acreage intentions relative to expectations is illustrated in Table 1 and Figure 1. In 2013, the total acreage of principal crops, prevented plantings, and acreage enrolled in the CRP was estimated at 362.6 million acres. The general expectation was that the total would be about the same in 2014. With 1.7 million fewer acres enrolled in the CRP and expectations for minimal prevented planted acreage, planting intentions for 2014 were expected to be much larger than in 2013. However, the total of planting intentions and enrollment in the CRP was 9.7 million acres less than the total of all acres in 2013. The sum is 3.3 million acres less than the smallest acreage total since 2007. These large differences lead some to the conclusion that not all of the crop land acreage was accounted for in the March report and that the USDA's June Acreage report later this year would reveal larger plantings, even if some acreage is prevented from being planted this year.

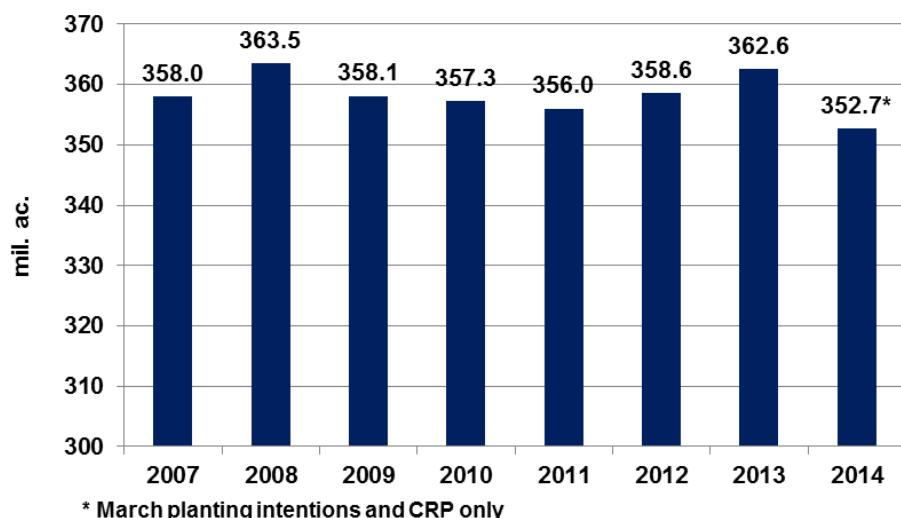
**Table 1. Planted Acres of Principal Crops, Prevented Plantings, and CRP --2007-2014**

Year	Planted	Prevented	CRP*	Total
----- million acres -----				
2007	320.4	1.6	36.0	358.0
2008	325.0	1.7	36.8	363.5
2009	319.3	4.2	34.6	358.1
2010	316.7	6.9	33.7	357.3
2011	315.1	9.6	31.3	356.0
2012	326.3	1.2	31.1	358.6
2013	324.8	8.3	29.5	362.6
2014	325.9**	?	26.8	352.7

\* Enrolled as of September 30 in the previous calendar year

\*\* March intentions

**Figure 1. Planted Acres of Principal Crops, Prevented Plantings, and CRP--2007-2014**



So, is there an explanation for the unexpectedly low estimate of planted acreage of the principal crops in the March report? A number of factors may contribute to the apparent shortfall in acreage. One factor might be the impact of price levels on total acreage planted. We have not done a formal analysis of long-term relationships between crop price levels and total acreage, but recent observations suggest there is some impact of the level and direction of new crop prices in the run-up to planting and the magnitude of planted acreage of principal crops plus prevented acres. High and/or increasing prices tend to result in larger acreage and *vice versa*. This year, the lower level of prices of some commodities, particularly corn prices, prior to the survey for March planting intentions may have discouraged crop planting intentions in some areas.

A second factor that may contribute to what appears to be a shortfall in acreage this year compared to recent historical levels is some “noise” in non-principal crop acreage. The CRP acreage used here, for example, is the acreage enrolled in the program as of September 30 in the year prior to spring planting. Actual CRP enrollment may have differed slightly from those estimates in some years. Additionally, planted acreage of non-principal crops is not included in the planted acreage shown in Table 1. Acreage of those crops varies some from year-to-year, which could account for a small part of the differences in total planted acreage from year-to-year. Finally, the total of planted acreage, prevented acreage, and CRP may vary from year-to-year due to issues associated with the estimates of prevented planted acres. Those estimates reflect mandated self-reporting by producers enrolled in federal programs and should therefore be a near-census estimate, but the data may well reflect some level of non-sampling errors. The issue could be similar to when annual acreage reduction programs were in place. In some years when those programs were in place, the total of planted and set-aside acres did not seem completely logical.

The third and most likely factor that explains a significant portion of the annual variation in the total of planted, prevented, and CRP acres is that of sampling error associated with the estimates of planted acreage. The USDA’s National Agricultural Statistics Service included the following statements relative to sampling error in the March 31, 2014 *Prospective Plantings* report:

*“The acreage estimates in this report are based primarily on surveys conducted during the first two weeks of March. The March Agricultural Survey is a probability survey that includes a sample of over 84,000 farm operators selected from a list of producers that ensures all operations in the United States have a chance to be selected.”*

*“The survey used to make acreage estimates is subject to sampling and non-sampling errors that are common to all surveys. Sampling errors represent the variability between estimates that would result if many different samples were surveyed at the same time. Sampling errors for major crops are generally between 1.0 and 3.0 percent, but they cannot be applied directly to the acreage published in this report to determine confidence intervals because the official estimates represent a composite of information from more than a single source.”*

Similar statements are included in the USDA’s June Acreage reports. Since sampling errors of some unknown magnitude may be reflected in estimates of planting intentions, the true value may differ from the point estimates that are published. With a sampling error of as little as two percent, for example, the 95 percent confidence interval for the estimate of plantings and planting intentions for principal crops would be 6.0 to 6.5 million acres.

The presence of sampling errors in the estimates of planted acreage and planting intentions means that one should be cautious in drawing conclusions when comparing acreage in one year to acreage in the previous year(s). It is not uncommon for market analysts to treat last year’s estimate of planted acreage and this year’s estimate of planting intentions as being completely free of sampling errors. It is likely that the true difference between those observations is larger or smaller than implied by the point estimates. Because of the presence of sampling errors it may be more valid to consider an average of previous year totals as the benchmark when making comparisons to this year’s total. For example, the average of total planted, prevented plantings, and CRP in Table 1 over 2007-2013 is 359.2 million acres, which is 3.4 million less than the total in 2013. But this average benchmark is still 6.5 million acres higher than the projected total for 2014. An even more conservative benchmark is to consider the lowest total during 2007-2013, which was 356 million acres in 2011. This is 3.3 million acres above the 2014 total.

## Conclusions

The initial reaction to the USDA's March prospective plantings estimates for 2014 was to anticipate larger acreage estimates in June, particularly if conditions point to minimal prevented planted acreage. One needs to be cautious in reaching such a conclusion, primarily due to the sampling variability that is inherent in the planted acreage estimates. Nonetheless, there does indeed appear to be some room for the acreage estimates for principal crops to exceed this year's estimate of planting intentions. If acreage estimates for principal crops do increase in the future, we expect the magnitude to be smaller than the 9.7 million acre difference between total acreage in 2013 and the total of planting intentions and CRP acreage for 2014. A conservative estimate would be an increase in the range of 2-4 million acres.

## Reference

USDA/NASS. *Prospective Plantings*. Released March 31, 2014.

<http://usda.mannlib.cornell.edu/usda/nass/ProsPlan//2010s/2014/ProsPlan-03-31-2014.pdf>