



Anticipating USDA Planted Acreage Revisions for Corn and Soybeans in 2021

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The size of U.S corn and soybean planted acreage plays an important role in the market outlook for both crops. The USDA released the 2021 *Prospective Plantings* report on March 31st and this report indicated that U.S. farmers intended to plant 91.444 million acres of corn and 87.6 million acres of soybeans this year. These estimates sent shockwaves through the grain markets. Futures prices for both crops did not take long after the report was released to move up the daily allow limit, a very unusual occurrence. Given the current tight balance between supply and demand for corn and soybeans, there has been considerable discussion since the release of the *Prospective Plantings* report about the possibility of USDA planted acreage estimates increasing in future reports, especially in the upcoming June *Acreage* report. The purpose of this article is to project revisions to USDA planted acreage estimates for corn and soybeans in 2021. The analysis builds upon the work in several recent *farmdoc daily* articles ([April 7, 2021](#); [April 14, 2021](#); [April 21, 2021](#); [April 28, 2021](#)).

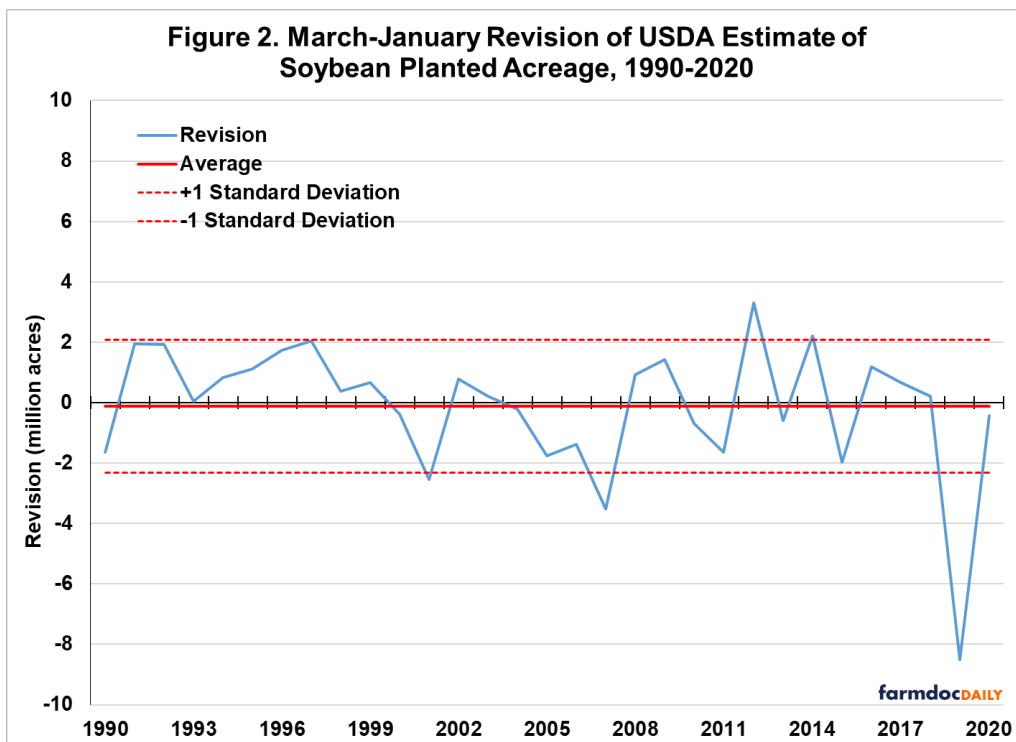
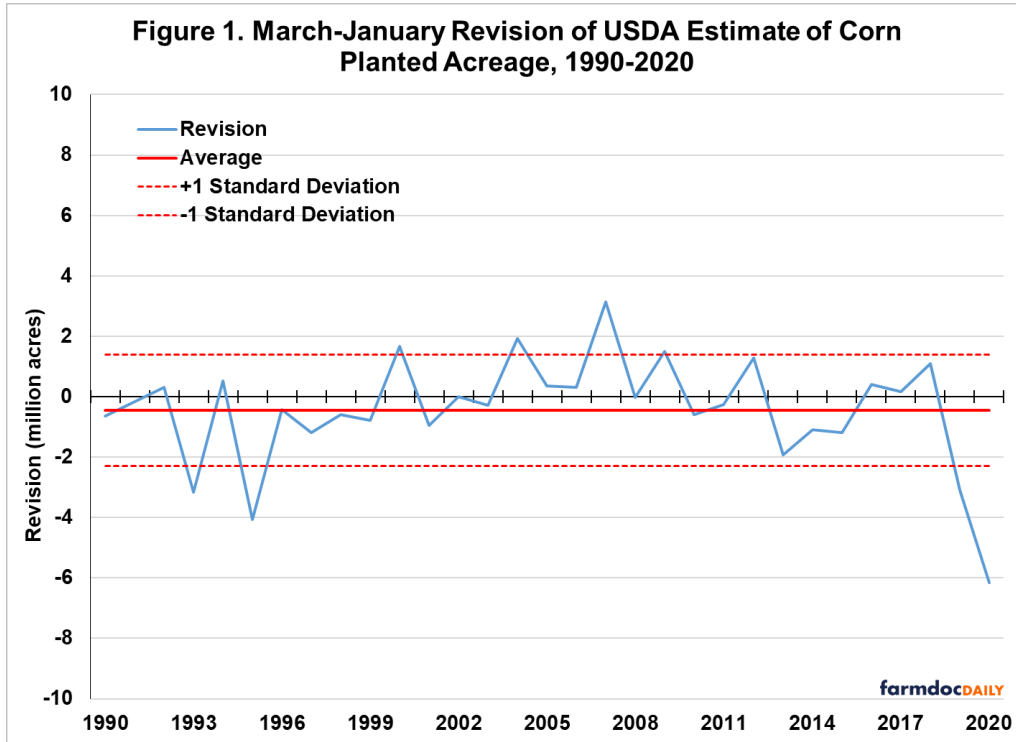
Analysis

To review, the first USDA planted acreage estimate for corn and soybeans in a crop year are provided in the March *Prospective Plantings* report. These estimates can and usually are revised in the June *Acreage* report. Planted acreage estimates can then be further revised in *Crop Production* reports released in August through November. Acreage revisions in *Crop Production* reports are usually very small except in October, when the USDA uses Farm Service Agency (FSA) acreage data to revise planted acreage estimates. Final planted (and harvested) acreage estimates are then made in the *Crop Production Annual Summary* report usually released in January after harvest. Further revisions can be made in the following crop year and after the *Agricultural Census*, which occurs every five years.

Similar to our previous work (*farmdoc daily*, [April 7, 2021](#); [April 14, 2021](#); [April 21, 2021](#); [April 28, 2021](#)), this analysis focuses on USDA planted acreage revisions between the March *Prospective Plantings* and the January *Crop Production Annual Summary* reports. The January estimate is usually considered the "final" for a crop year. Hence, the change in estimates between March and January is the most relevant measure of the total revision for a crop year to the market.

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When trying to anticipate USDA planted acreage revisions for corn and soybeans it is important to keep in mind some basic facts. The first, as shown in Figures 1 and 2 for corn and soybeans, respectively, is that the average revision over 1990-2020 is very close to zero. Note that revisions are computed as the January estimate minus the March estimate, so positive numbers mean that planted acreage estimates increase between March and January, and *vice versa*. From a statistical standpoint, this indicates that USDA acreage revisions are (unconditionally) unbiased. In other words, based solely on the history of USDA acreage revisions, the best expectation of final USDA acreage estimates at the present time are those published in the March *Prospective Plantings* report.



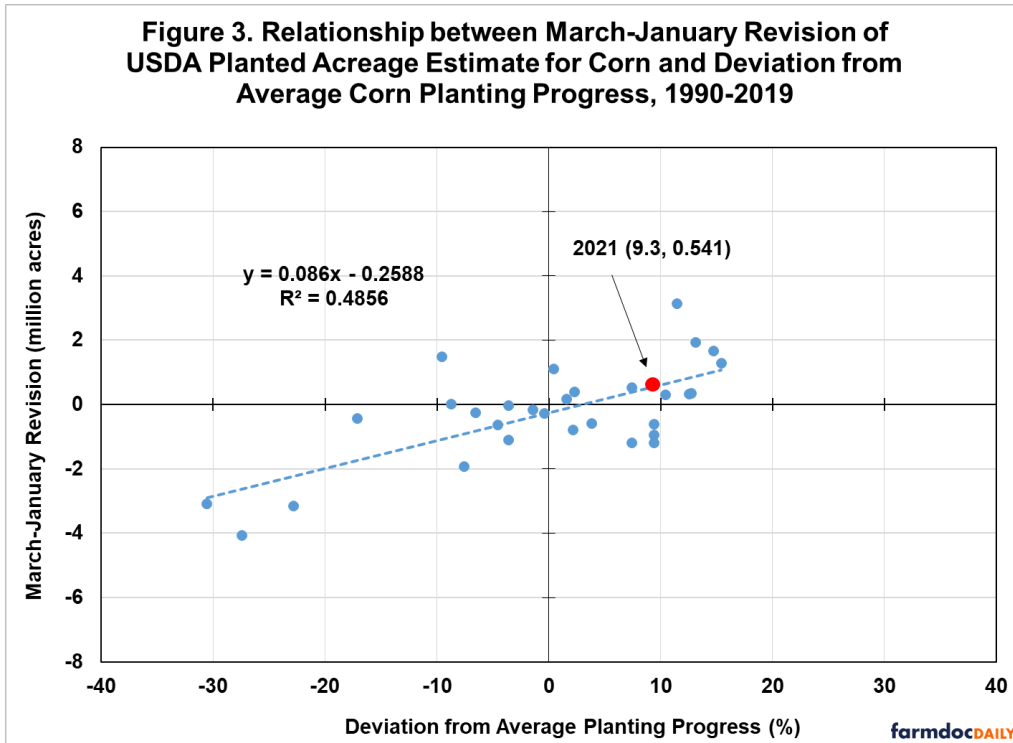
The second fact is that we should expect USDA planted acreage estimates to change in future reports, but the direction and magnitude cannot be predicted without information beyond the USDA track record of revisions. As a guide to the potential for future revisions, the likely range shown in Figures 1 and 2 is roughly plus/minus two million acres for corn and soybeans. While the history of USDA revisions leaves open the potential for planted acreage estimates to increase, that same history indicates that a decrease in planted acreage estimates is about as likely as an increase.

This analysis does not mean USDA planted acreage revisions cannot be anticipated, only that additional information is required to do so. In an earlier *farmdoc daily* article ([April 21, 2021](#)), we analyzed whether revisions can be predicted based on two important pieces of additional information: i) price movements after the release of the March *Prospective Plantings* report, and ii) planting progress. Virtually no evidence is found that changes in new crop corn and soybean futures prices over April-May are useful for predicting USDA planted acreage revisions for the two crops. That analysis is extended here to consider longer-term price trends for corn and soybeans. Specifically, the change in new crop corn and soybean futures prices from the end of April in the previous year to the end of April for the current year are considered as predictor variables for acreage revisions. Once again, no evidence of a relationship is uncovered. In sum, it appears that it is very difficult to predict USDA planted acreage revisions for corn and soybeans from short-term or long-term price movements.

We did find in our earlier work that there is a positive and statistically significant relationship between corn planting progress and acreage revisions, but not for soybeans. Specifically, a 10 percent faster than normal planting progress leads to an 0.822 million acre increase in the area planted to corn. A caution is that the R2 for the regression is still fairly modest at 29.5 percent, which means that a wide range of acreage revisions is possible for each level of corn planting progress. The explanatory power does rise to 48.6 percent if the 2020 observation is deleted. In 2020, most of the U.S. corn crop was planted in a timely manner and this explains the above average planting progress. However, planting was delayed considerably in the Dakotas and this led to substantial prevented planting acres in those states, which in turn helped to pull down the U.S. corn planted acreage estimate after March.

Figure 3 shows estimated relationship between corn acreage revisions and planting progress over 1990-2019. The observation for 2020 is treated as an outlier and omitted for prediction purposes. In order to predict the USDA corn planted acreage revision using this model one must first forecast the deviation from average planting progress for 2021. Corn planting progress is defined as the amount of corn acreage in the U.S. planted before May 20th. The latest available *Crop Progress* report from the USDA indicates that 80 percent of the corn crop was planted as of May 16th. We assume that an additional 10 percent will be planted between May 16th through May 20th, resulting in total progress of 90 percent. Since average progress on this date is 80.7 percent, the projected deviation for 2021 is 9.3 percent. Using the model in Figure 3, this level of planting progress projects a USDA planted acreage revision for corn of 0.541 million acres. It is important to emphasize once again that the regression is not estimated with a great deal of precision. Revisions at this level of corn planting progress could easily range from roughly plus/minus two million acres.

Figure 3. Relationship between March-January Revision of USDA Planted Acreage Estimate for Corn and Deviation from Average Corn Planting Progress, 1990-2019



Analysis in a different *farmdoc daily* article ([April 28, 2021](#)) found that there is a moderately strong relationship between prevented plant acreage and USDA acreage revisions for corn and soybeans. This makes sense because acreage revisions from the USDA should, in theory, fully incorporate prevented plant acreage that does not get planted due to weather problems. Hence, if one can predict prevented plant acreage then one should be able to anticipate USDA acreage revisions for a given year. Figures 4 and 5 present the estimated relationship between USDA planted acreage revisions and prevented plant acreage over 2007-2020 for corn and soybeans, respectively. Given the relatively fast pace of corn and soybean planting progress this year, it seems reasonable to project historically small levels of prevented planting for both corn and soybeans. Analysis of previous years with similar levels of planting progress suggests prevented plant acreage in 2021 for corn of about 1 million acres and for soybeans of about 0.5 million acres. Using the models in Figures 4 and 5, these levels of prevented plant projects USDA planted acreage revision for corn of 0.386 million acres and for soybeans 1.06 million acres. It is interesting to note the consistency in the predictions for the corn acreage revision based on planting progress and prevented planting. Both are in the ballpark of a half a million acre increase. Finally, it is straightforward to construct alternative projections of corn and soybean acreage revisions based on different levels of prevented plantings using the models in Figures 4 and 5.

Figure 4. Relationship between USDA Revision of Planted Acreage Estimate between March and January and Prevented Plant Acreage for Corn, 2007-2020

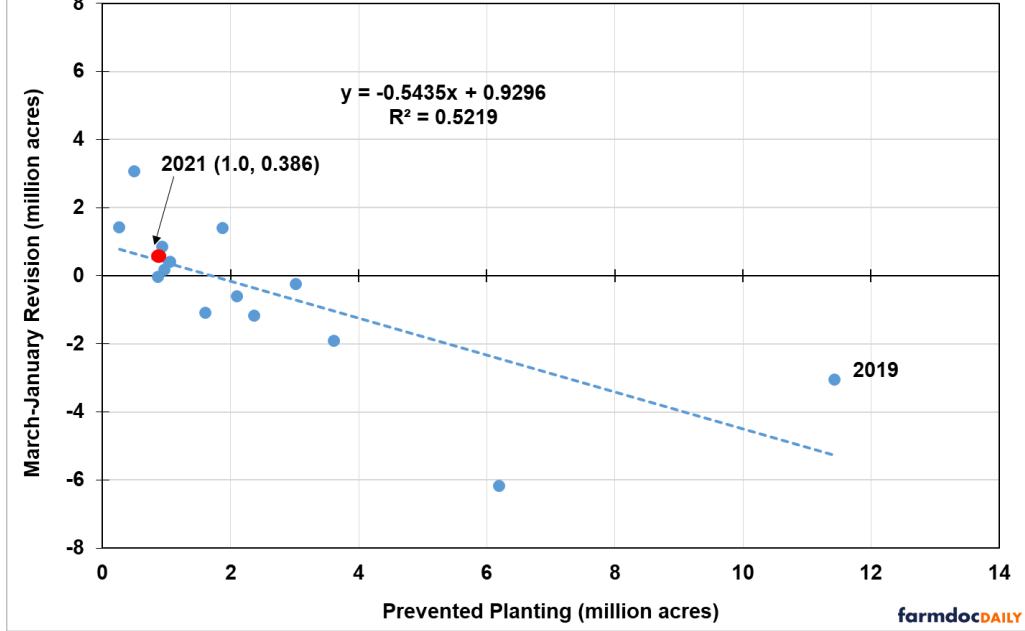
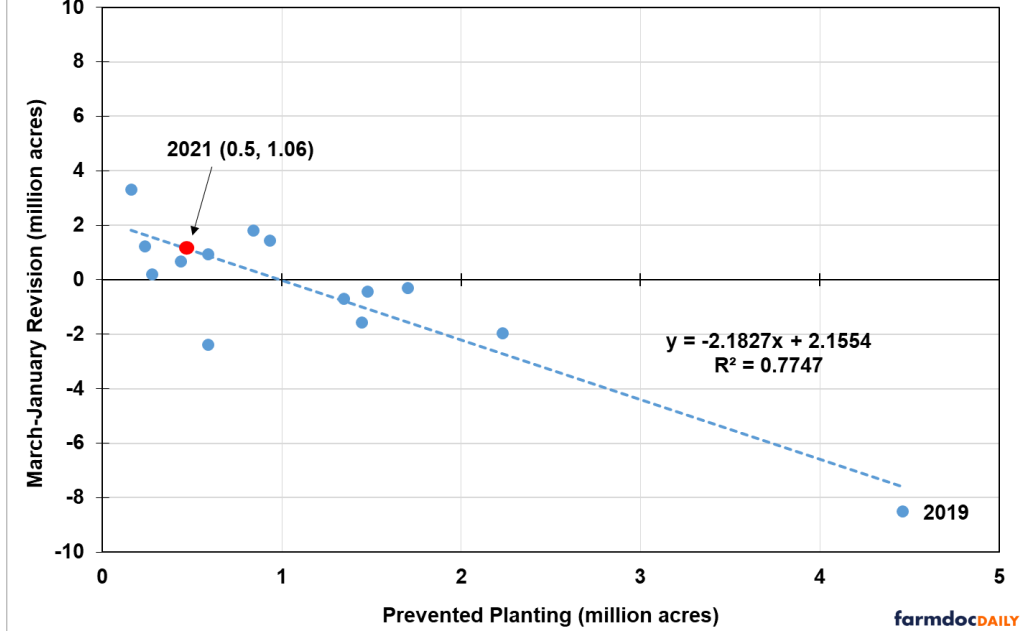


Figure 5. Relationship between USDA Revision of Planted Acreage Estimate between March and January and Prevented Plant Acreage for Soybeans, 2007-2020



Implications

There has been considerable discussion in the market about the potential for USDA planted acreage estimates for corn and soybeans to increase from the levels reported in the March 30th *Prospective Plantings* report. The purpose of this article is to project revisions to USDA planted acreage estimates for corn and soybeans in upcoming reports. It is important to emphasize at the outset the difficulty of projecting USDA planted acreage revisions. From a statistical standpoint, USDA acreage revisions are (unconditionally) unbiased. In other words, based solely on the history of USDA acreage revisions, the

best expectation of final USDA acreage estimates at the present time are those published in the March *Prospective Plantings* report. This does not mean that we do not expect USDA planted acreage estimates to change in future reports, only that the direction and magnitude cannot be predicted without information beyond the USDA track record of revisions. In that vein, we analyze whether corn and soybean acreage revisions can be predicted based on price movements, planting progress, and prevented plant acreage. It appears to be especially difficult to predict USDA planted acreage revisions for corn and soybeans from short-term or long-term price trends. There is a moderately strong relationship between acreage revisions in corn and planting progress and acreage revisions for both corn and soybeans and prevented plant acreage.

Projections of planting progress and prevented plant acreage suggest USDA planted acreage revisions for corn and soybeans in 2021 of about 500,000 acres for corn and 1 million acres for soybeans. This implies final planted acreage estimates of around 92 million acres for corn and 88.6 million acres for soybeans. There is, of course, considerable uncertainty in these estimates. Other information may be available that results in higher or lower estimates of final planted acreage.

References

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