



**AgEcon** SEARCH

RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

*No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.*



## Understanding the 2018 Farm Bill PLC Yield Update: Corn, Soybean, Sorghum, and Upland Cotton by State

Carl Zulauf

Department of Agricultural, Environmental and Development Economics  
Ohio State University

Gary Schnitkey, Krista Swanson, Jonathan Coppess, Nick Paulson

Department of Agricultural and Consumer Economics  
University of Illinois

March 22, 2019

*farmdoc daily* (9): 51

Gardner Policy Series

---

Recommended citation format: Zulauf, C., G. Schnitkey, K. Swanson, J. Coppess, and N. Paulson. "Understanding the 2018 Farm Bill PLC Yield Update: Corn, Soybean, Sorghum, and Upland Cotton by State." *farmdoc daily* (9): 51, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, March 22, 2019.

Permalink: <https://farmdocdaily.illinois.edu/2019/03/understanding-the-2018-farm-bill-plc-yield-update-corn-soybean-sorghum-and-upland-cotton-by-state.html>

---

This is the 4<sup>th</sup> article in a series examining the 2018 farm bill PLC (Price Loss Coverage) yield update option. A [2/20/2019](#) article found that, of 21 program commodities, only corn, soybeans, upland cotton, and, especially sorghum have a US national PLC yield that is higher with the 2018 than with the 2014 farm bill update formula. This article continues the analysis of these 4 crops by examining the yield update by state. The other *farmdoc daily* articles in this series ([1/17/2019](#) and [2/7/2019](#)) examine the important impact of crop rotation on PLC update yield.

### 2018 Farm Bill Yield Update

The *Agriculture Improvement Act of 2018* gives FSA (Farm Service Agency) farm owners a 1-time option to update PLC payment yield using the following formula:

$$(90\% \text{ times average } 2013\text{-}2017 \text{ yield of a covered commodity on a FSA farm}) \\ \text{times} \\ (\text{average US } 2008\text{-}2012 \text{ yield divided by average US } 2013\text{-}2017 \text{ yield of the covered commodity})$$

Yield is per planted acre. The US yield ratio (2<sup>nd</sup> formula term) cannot be less than 0.90 nor more than 1.00. If all other factors are the same, the update formula implies an FSA farm will benefit from the update if its average yield increased more than US average yield from 2008-2012 to 2013-2017.

---

We request all readers, electronic media and others follow our citation guidelines when re-posting articles from *farmdoc daily*. Guidelines are available [here](#). The *farmdoc daily* website falls under University of Illinois copyright and intellectual property rights. For a detailed statement, please see the University of Illinois Copyright Information and Policies [here](#).

Rationally, an owner will decide to update PLC yield only if the above formula generates an update yield that exceeds the existing PLC yield. This decision rule framed all previous updates, including the 2014 farm bill update. The 2014 yield update formula was:

(90% times average 2008-2012 yield per planted acre of a covered commodity on a FSA farm)

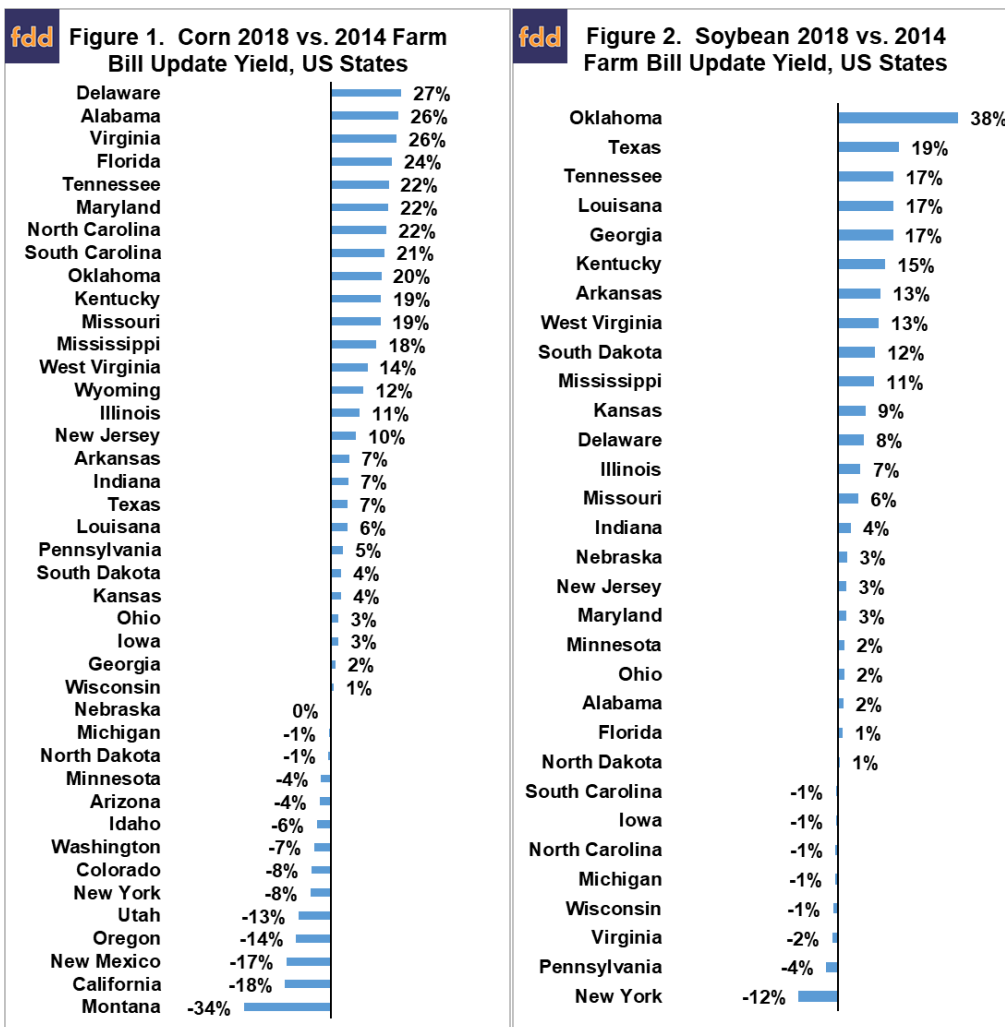
## Data and Procedures

State yield per planted acre is computed for each year from 2008 to 2017 using data from *QuickStats* (US Department of Agriculture). The formulas in the preceding section are used to calculate 2014 and 2018 update yields. The 2 yields are compared, in essence, assuming the 2014 update yield is the existing PLC yield. Data Note 1 contains added discussion of procedures.

## Corn and Soybeans

Relative to 2014 corn update yield, 2018 update yield ranges from +27% higher for Delaware to -34% lower for Montana (see Figure 1). Overall, 2018 corn update yield is higher for 66% of states accounting for 71% of 2013-2017 production. Of the 10 largest corn producing states, 2018 exceeds 2014 update yield by double digits for Missouri (+19%) and Illinois (+11%).

Relative to 2014 soybean update yield, 2018 update yield ranges from +38% higher for Oklahoma to -12% lower for New York (see Figure 2). Overall, 2018 soybean update yield is higher for 74% of states accounting for 79% of 2013-2017 production. Of the 10 largest soybean producing states, South Dakota (+12%) has a 2018 update yield that exceeds 2014 update yield by double digits.

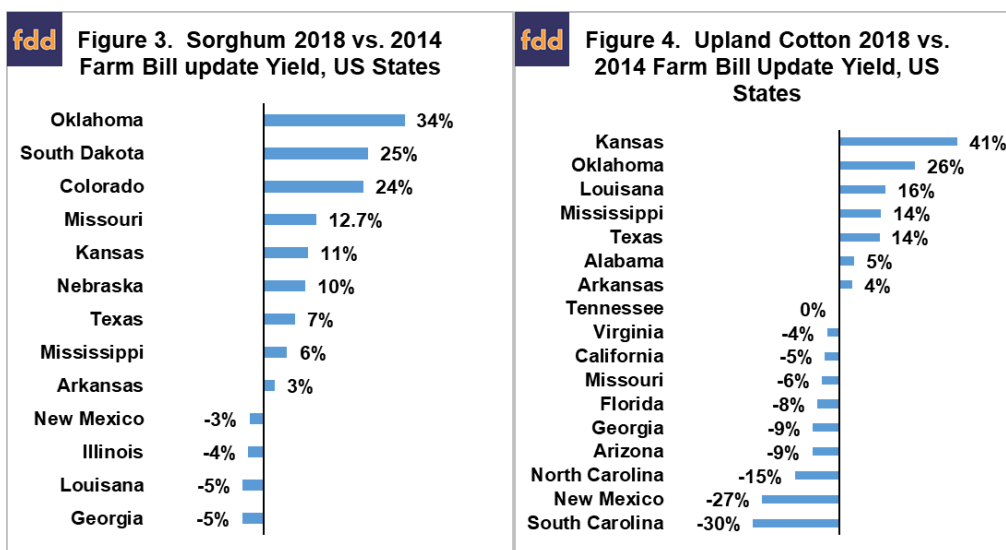


For states having both corn and soybean yield data, percent change in corn update yield explains only 3% of percent change in soybean update yield. This low common explanatory power implies corn and soybean update decisions will likely differ for many farms, not only in magnitude but also whether or not PLC yield will be updated.

### Sorghum and Upland Cotton

Relative to 2014 sorghum update yield, 2018 update yield ranges from +34% higher for Oklahoma to -5% lower for Georgia and Louisiana (see Figure 3). Overall, 2018 sorghum update yield is higher for 69% of states accounting for 97% of 2013-2017 production. Kansas and Texas, which account for 49% and 28% of production, have 2018 update yields that are +11% and +7%, respectively, higher than their 2014 update yields.

Relative to 2014 upland cotton update yield, 2018 update yield ranges from +41% higher for Kansas to -30% lower for South Carolina (see Figure 4). Overall, 2018 upland cotton update yield is higher for 41% of states accounting for 63% of 2013-2017 production. Texas and Georgia, which account for 42% and 15% of production, have 2018 update yields that are +14% higher and -9% lower, respectively, than their 2014 update yields.



### Summary Observations

- A consistent theme that emerges from the 4 articles on the 2018 PLC yield update is the large variation across the unit analyzed, whether it be farm, state, or US. This conclusion holds even if negative update yield changes are removed since farms can keep their higher existing PLC yields.
- The largest changes in update yield occur in small producing states. This finding partly reflects their small production, which is a variation of the small sample size issue found for rotation's impact on yield update (*farmdoc* daily [January 17, 2019](#)).
- Large producing states can have sizable increases in update yield. Double digit increases are estimated for Missouri corn (+19%), Texas cotton (+14%), South Dakota soybeans (+12%), Illinois corn (+11%), and Kansas sorghum (+11%).
- As with the previous analyses, the large variation by state in 2018 vs. 2014 update yield raises the general policy question of whether the 2014 and 2018 yield update formulas meet the fairness criteria for policy, especially in a period when farm program payments may impact the relative prosperity of farms and even determine who survives if financial stress occurs?
- The same specific policy questions also arise: (1) "Is a 5-year update window too short?"; (2) "Should farmers be required to annually report yields by FSA farm to permit more accurate

determination of a farm's expected yield?"; and (3) "Should trend-adjusted yield methods be used?"

## Data Notes

1. For soybeans and upland cotton, planted yield equals (production / planted acres). For corn and sorghum, planted acres are reduced by harvested silage acres. Upland cotton yields are used for seed cotton since, as specified in the farm bill, yield for seed cotton is 2.4 times the yield of upland cotton. The constant 2.4 conversion factor means it cancels out in this analysis.

## References and Data Sources

Congressional Research Service. "The 2014 Farm Bill (P.L. 113-79): Summary and Side-by-Side Comparison." Report R43076. February 12, 2014. <http://nationalaglawcenter.org/wp-content/uploads/2014/02/R43076.pdf>

Swanson, K., J. Coppess, G. Schnitkey and C. Zulauf. "Impact of Policy Changes on Price Loss Coverage Payments." *farmdoc daily* (9):22, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, February 7, 2019.

US Congress. *Agriculture Improvement Act of 2018*. <https://www.congress.gov/bill/113th-congress/house-bill/2642>

US Department of Agriculture, National Agricultural Statistics Service. *QuickStats*. January 2019. <http://quickstats.nass.usda.gov/>

Zulauf, C., G. Schnitkey, J. Coppess, N. Paulson and K. Swanson. "PLC Base Yield Updates – The Importance of Crop Rotation." *farmdoc daily* (9):9, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, January 17, 2019.

Zulauf, C., G. Schnitkey, K. Swanson, J. Coppess and N. Paulson. "Understanding the 2018 Farm Bill PLC Yield Update: Which Program Commodities Have a Higher Update Yield at the US Market Level?" *farmdoc daily* (9):30, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, February 20, 2019.