



Variability in County Corn Yields: 2012 to 2016

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Focus soon will turn to 2017 yield estimates as USDA will release their first estimates of national and state yields on August 10th. In preparation for this release, national corn yields from 1972 to 2016 are shown in this article. These national trends illustrate that corn yields have been above trend in all years since 2013. Also, maps are shown giving county yield deviations from trend for each year from 2012 to 2016. These maps illustrate the extreme variability in yields across counties in any given year, making it difficult to evaluate national yields given only a perspective from a limited area. Comparisons of 2017 drought maps to those from previous years suggest a U.S. yield near or below trend.

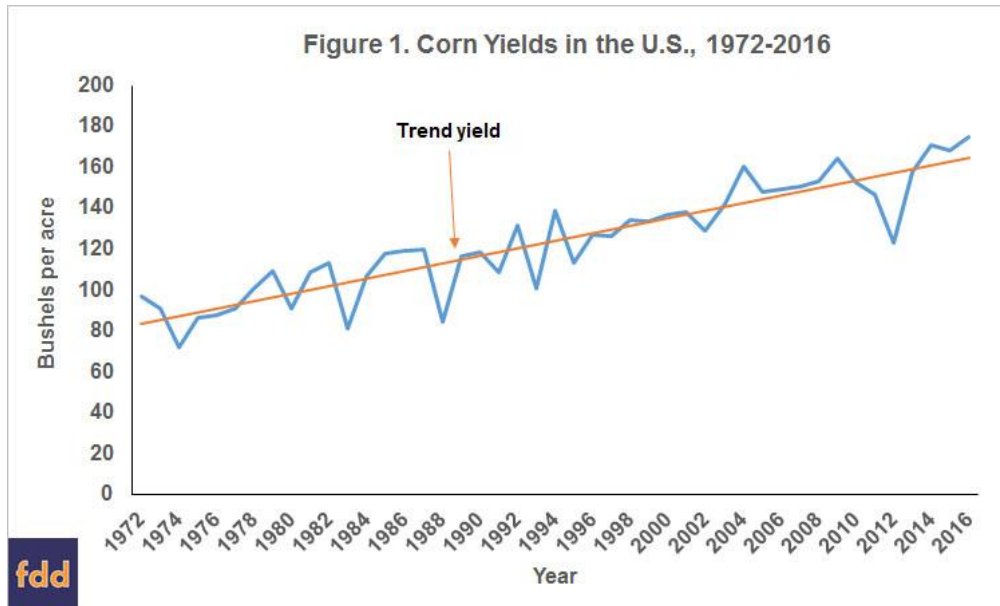
U.S. Corn Yields

The average yield of corn in the U.S. was 171.0 bushels per acre in 2014, 168.4 bushels per acre in 2015, and 174.6 bushels per acre in 2016. In the last three years, corn yields have been above a linear trend line fit through the yield data from 1972 to 2016 (see Figure 1). Corn yields were 10 bushels above trend in 2014, 5 bushels per acre above trend in 2015, and 10 bushels above trend in 2016. The recent above trend yields have provided a larger supply of corn. Corn prices likely would have been higher had corn yields been at or below trends (see *farmdoc daily* [January 11, 2017](#)).

Yields were low or close to trend in the two years immediately prior 2014. In the 2012 drought year, corn yield in the U.S. was 123.1 bushels per acre, 34 bushels below trend. In 2013, the national corn yield was 158.1 bushels per acre, one bushel below trend.

The following sections show maps giving county yields minus trend yields for the years from 2012 to 2016 (see *farmdoc daily* [May 2, 2017](#) for an explanation of the calculation mechanism. These yields come from National Agricultural Statistical Service's *QuickStat* website. Also shown are U.S. Drought Monitor maps (<http://droughtmonitor.unl.edu/>) produced at the University of Nebraska. The map for each year comes at the end of July. End of July is at the end of pollination, a key period for determining corn yields. Areas in drought at the end of July likely had stress during pollination. The maps illustrate that below trend yields are correlated with areas as indicated in drought, but the correlation is not perfect.

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2012

The national yield in 2012 of 123.1 bushel per acre was 34 below trend. The 2012 drought impacts most areas of the Midwest and many counties in eastern Nebraska, Iowa, Illinois, Indiana, and Ohio had actual yields that were 25 bushels below trend (see Figure 2). The 2012 drought was widespread and severe as is indicated by the Drought Monitor Map on July 31, 2012 (see Figure 3).

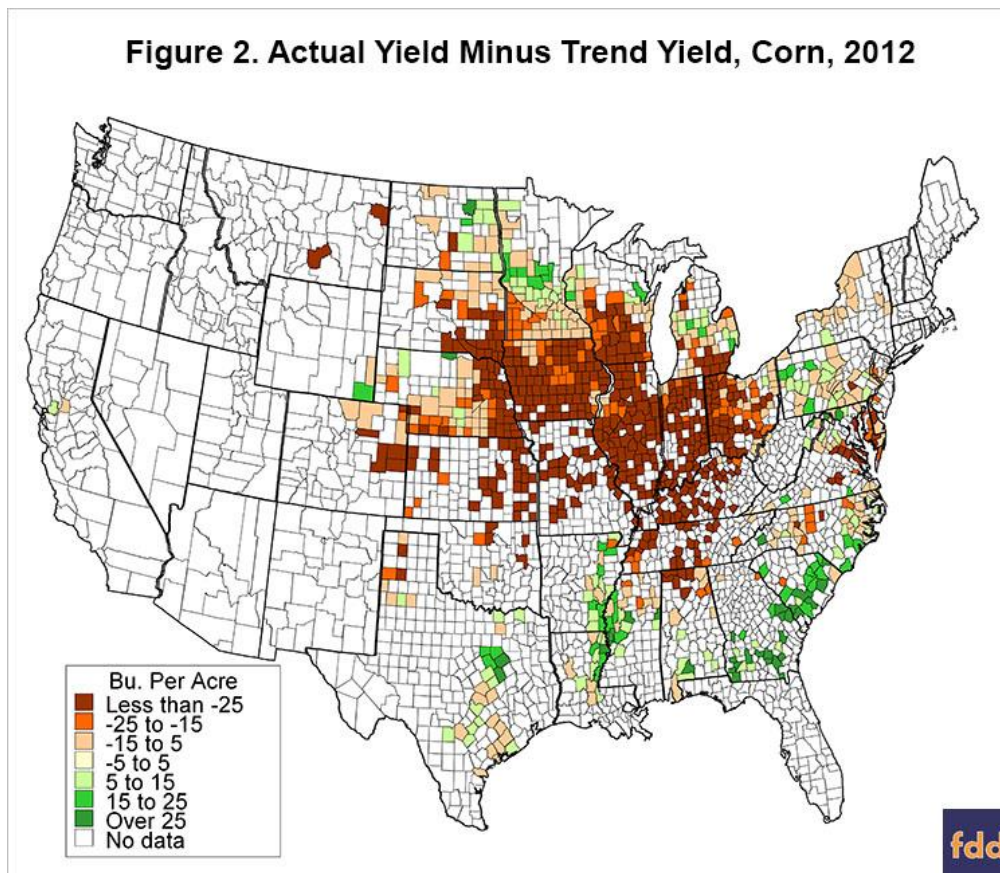
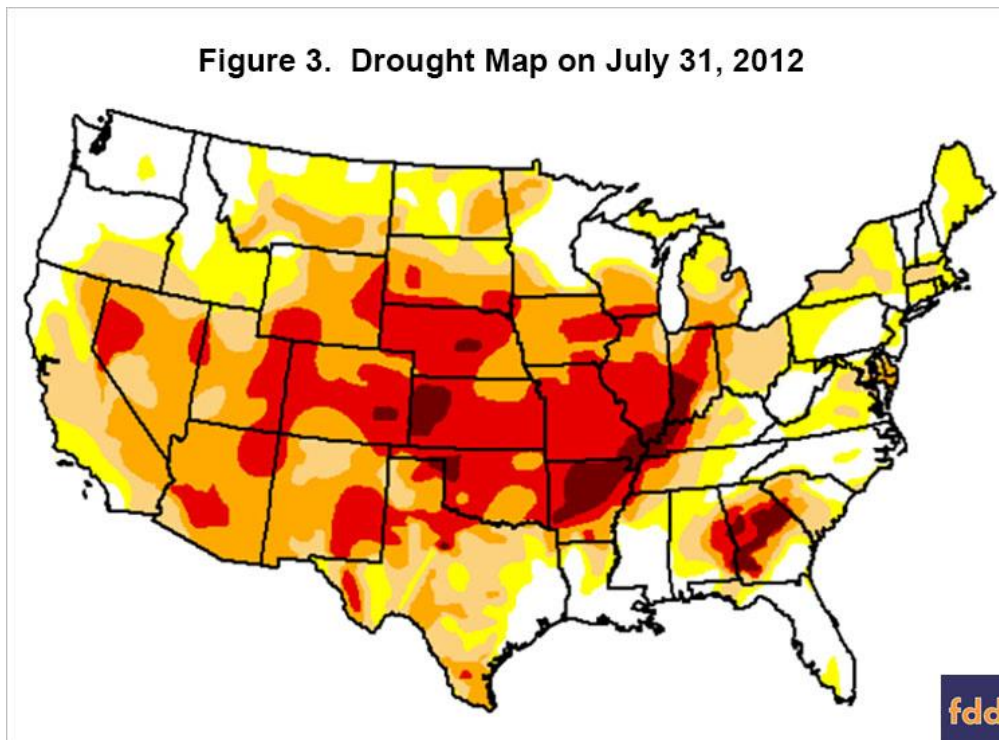


Figure 3. Drought Map on July 31, 2012



Two points about the drought year. First, most areas of the country had to be impacted by the drought for the national yield to be as low as it was in 2012. Second, even given the widespread nature of the drought, there were counties that had above average yields. Central Minnesota, the Mississippi Delta, and South Carolina had significant number of counties with above trend yields (see Figure 2).

2013

The national yield in 2013 of 158.1 bushels per acre was 1 bushel per acre below trend. From a national yield standpoint, 2013 was a near trend year. While near trend from a national standpoint, the western and eastern Corn Belt had different experiences in 2013 (see Figure 4). The western Corn Belt generally had low yields. Low yields were centered around two sets of counties: one set in west-central Iowa and the other in east-central Minnesota and western Wisconsin. The low yields in the western Corn Belt were associated with a drought as indicated by U.S. Drought Monitor Map on July 30, 2013 (see Figure 5). Offsetting poor yields in the western Corn Belt, were above trend yields in the eastern Corn Belt. Many counties in Indiana and Ohio had actual yields that were 25 bushels above trend yields. In addition, many counties along the eastern seaboard and mid-South also had good yields. Overall, poor yields in the western Corn Belt were offset by good yields in the east, leading to a national year close to trend.

2014

The national yield in 2014 of 171 bushels per acre was 10 bushels per acre above trend. In terms of being above trend, only 8 years out of 45 years since 1972 have had higher yields than 2014. Overall, 2014 was a significantly above average year on a national basis.

While being above average, there still was a significant portion of the Midwest with below average yields. Middle Minnesota had many counties whose corn yields were 25 bushels below trend (see Figure 6). Many counties in Iowa, Minnesota, and North Dakota had below trend yields. Offsetting those below trend yields were above trend yields in Illinois, Indiana, and western Ohio. The Mississippi Delta, South, and eastern Seaboard also had an above trend yielding year.

The low yields in Minnesota were not associated with a drought, as can be seen by the July 29, 2014 drought monitor map (see Figure 7).

Figure 4. Actual Yield Minus Trend Yield, Corn, 2013

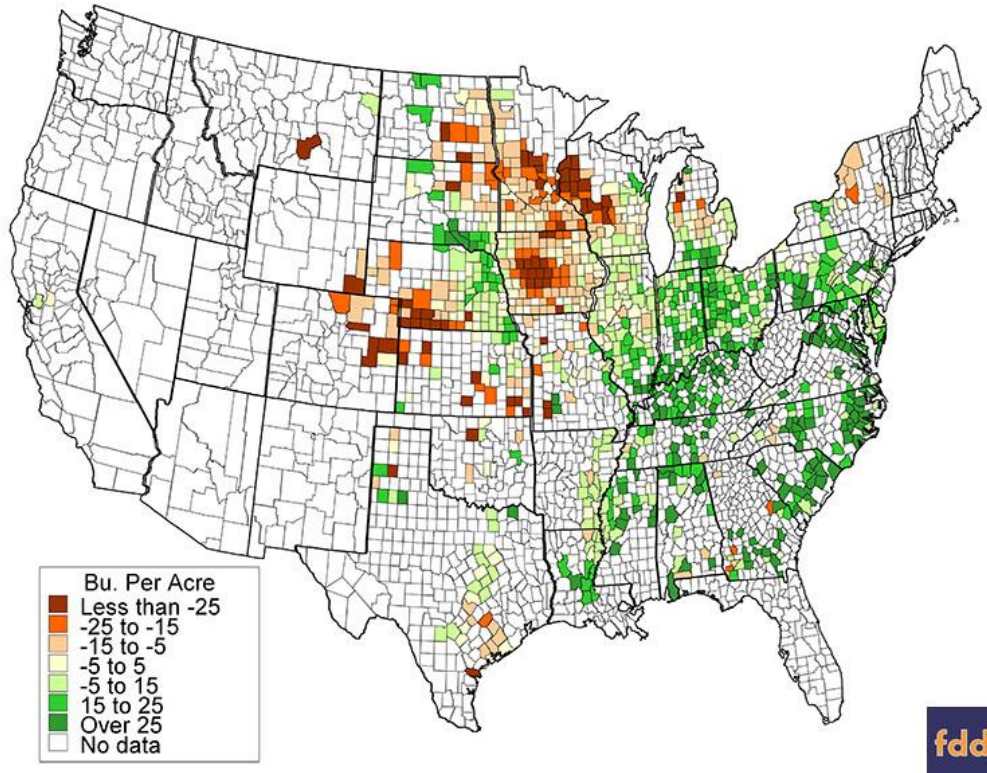


Figure 5. U.S. Drought Monitor Map on July 30, 2013

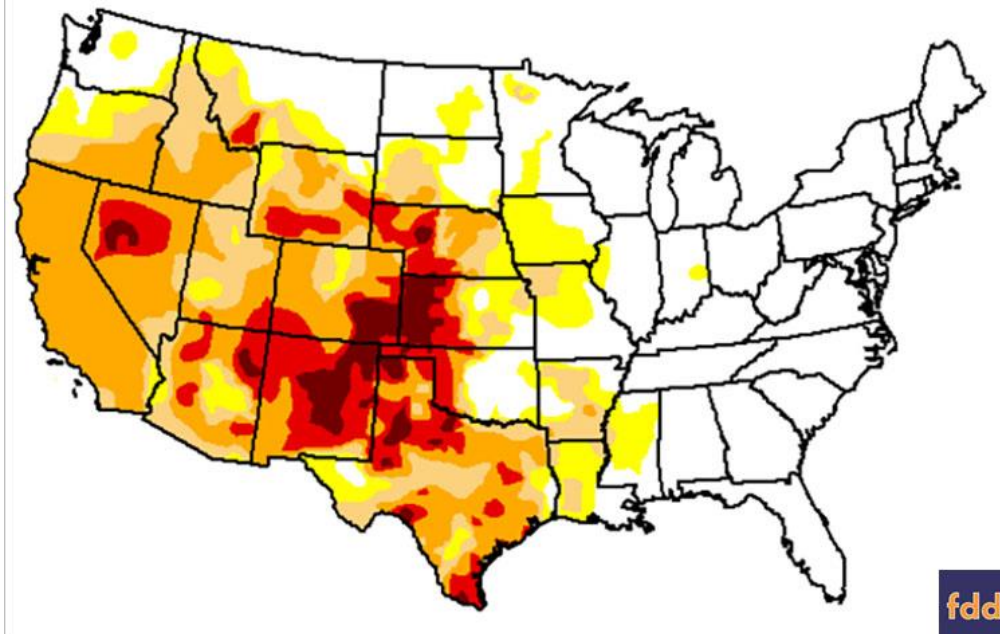


Figure 6. Actual Yield Minus Trend Yield, Corn, 2014

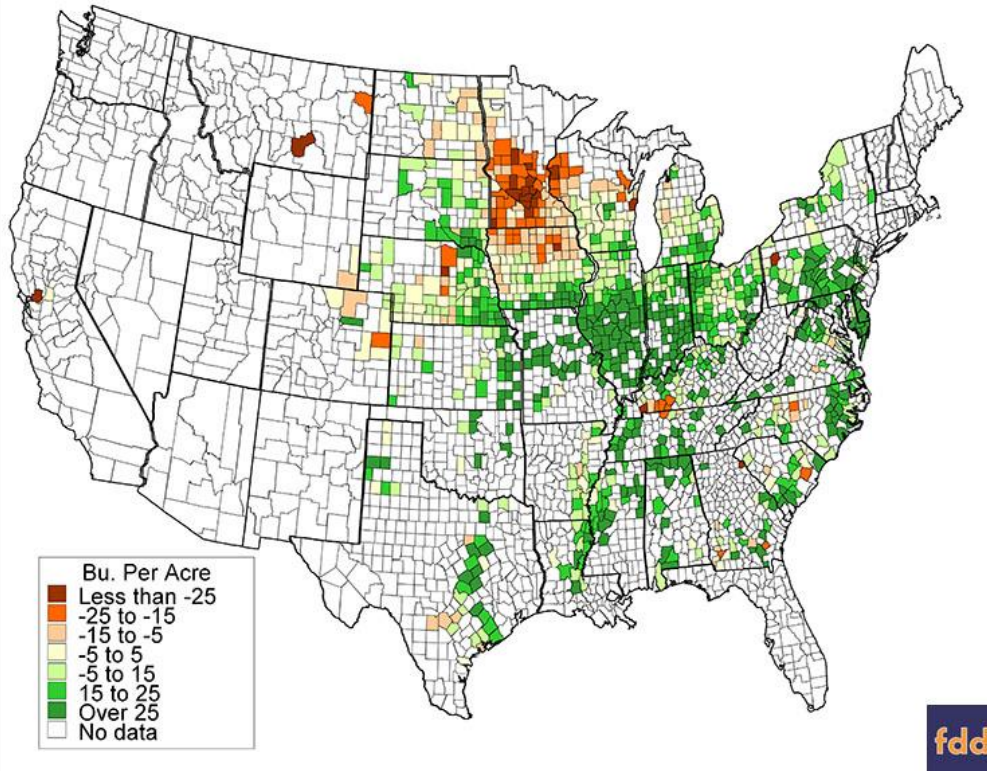
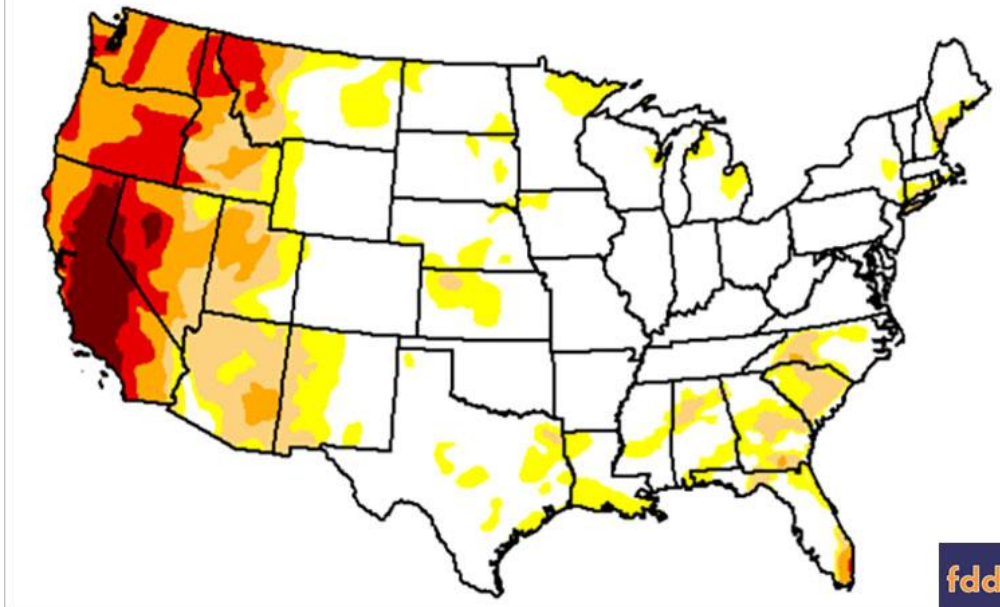


Figure 7. U.S. Drought Monitor on July 29, 2014



2015

The national yield in 2015 of 168.4 bushels per acre was 5 bushels per acre above trend. Sixteen out of 45 years since 1972 had a more positive difference from trend. In percentage terms, 36% of the years had a more positive difference from trend.

Like 2014, there was an area of counties with below trend yields. This year those counties were in northern Indiana and western Ohio (see Figure 8). These areas were not associated with drought (see Figure 9). In addition, many counties in west central Illinois had counties yields that were more than 5

bushels below trend. Rather it was wet weather that injured crops. Iowa, Minnesota, South Dakota, and Nebraska had yields above trend.

Figure 8. Actual Yield Minus Trend Yield, Corn, 2015

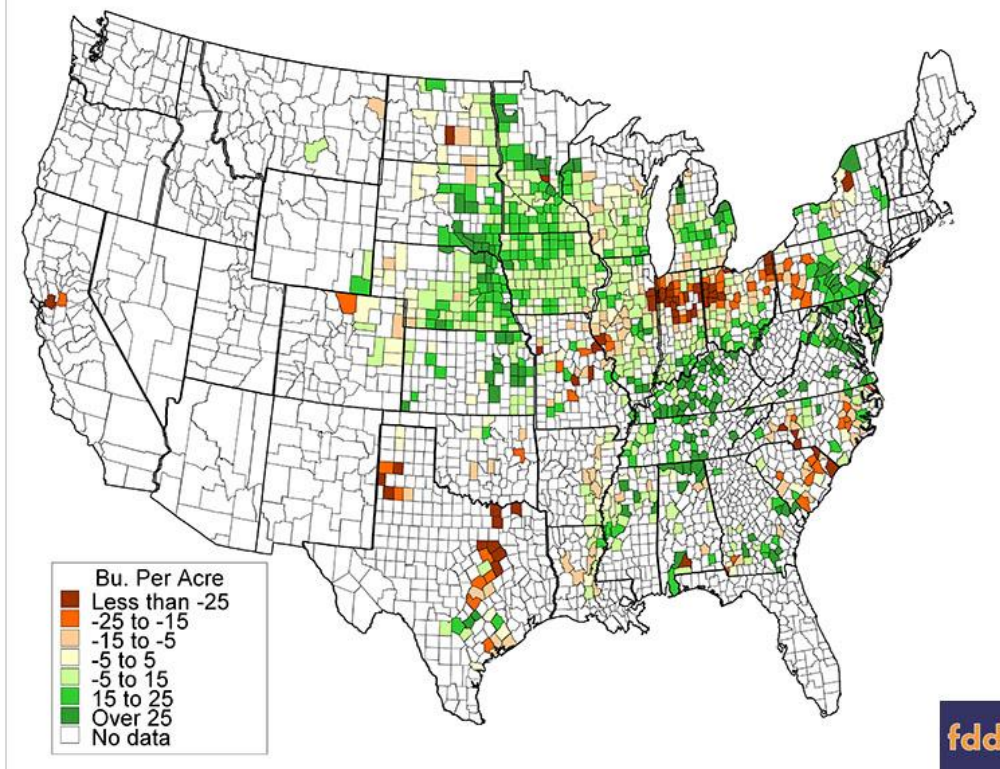
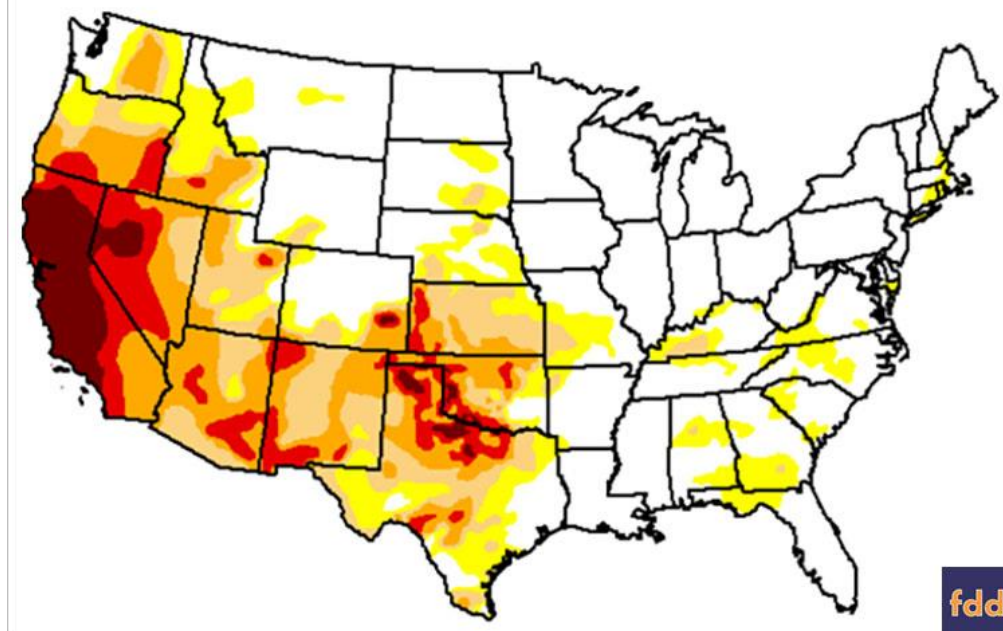


Figure 9. U.S. Drought Monitor on July 28, 2015



2016

The national yield in 2015 of 174.6 bushels per acre was 10 bushels per acre above trend. From a national trend yield standpoint, 2016 was similar to 2014.

In 2016, low yielding counties were focused in Ohio (see Figure 10). Indiana generally had close to trend yields and not an exceptional year. Areas of lower yield were associated with a drought (see Figure 11). Illinois had many counties that were over 25 bushels above trend. Good yields predominated in the western Corn Belt as well. However, there were many counties in southern Minnesota and northern Iowa that were close to trend.

Figure 10. Actual Yield Minus Trend Yield, Corn, 2016

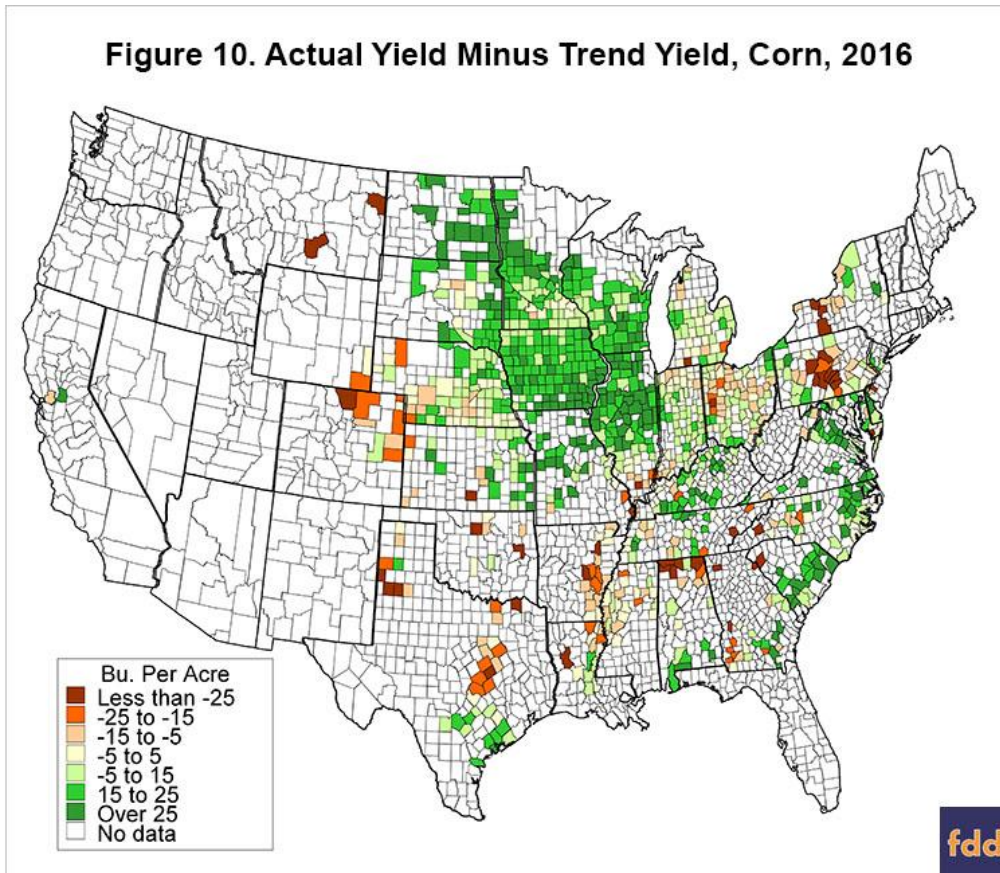
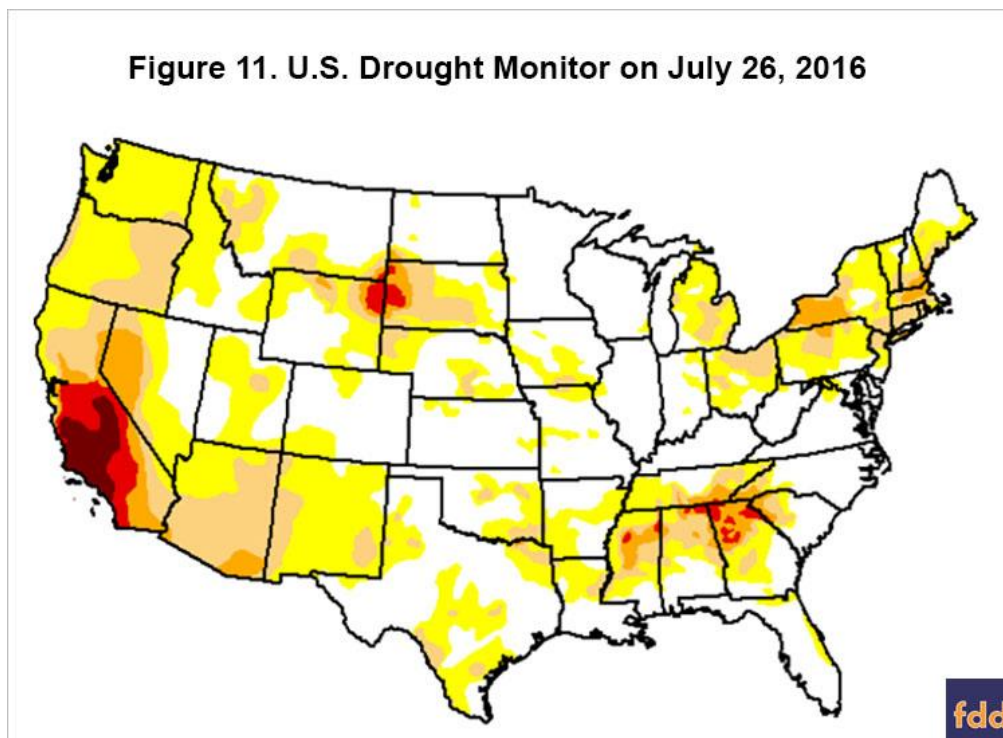


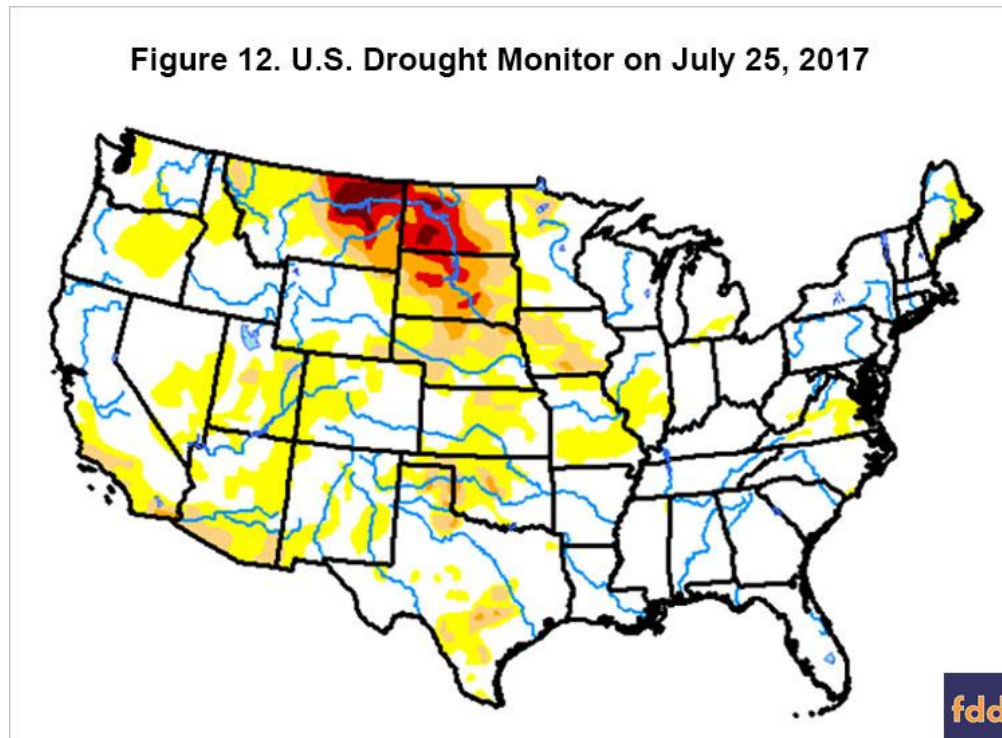
Figure 11. U.S. Drought Monitor on July 26, 2016



Commentary and Pointing to 2017 Corn Yields

National yields mask a great deal of variability in yields across the country. In almost every year, there are significant differences in county yields even across the Corn Belt. Only in extreme years do all counties tend to have above or below average yields.

For 2017, areas of the Corn Belt are facing production difficulties. For example, there are significant areas where dry conditions exist from North and South Dakota, Iowa, Nebraska, Iowa, and Illinois (see Figure 12). From a drought standpoint, 2017 looks somewhat similar to 2013 in which the western Corn Belt faced a drought while the eastern Corn Belt had a good year. Drought results point to below trend yields in much of the western Corn Belt. Then, the question remains what will yields be in the eastern Corn Belt. Wet weather and rains have occurred in northern Illinois, Indiana, and Ohio. These could hurt yields.



This year does not appear to be a year like 2012 in which yields were severely damaged. This year also does not appear to be a year like 2014 and 2015 in which national yield was well above trend. Overall, 2017 national yield appears to be near or below trend given the current drought monitor map and anticipated wet weather difficulties in Indiana. More will be revealed as yield tours occur and NASS releases its yield estimates.

References

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