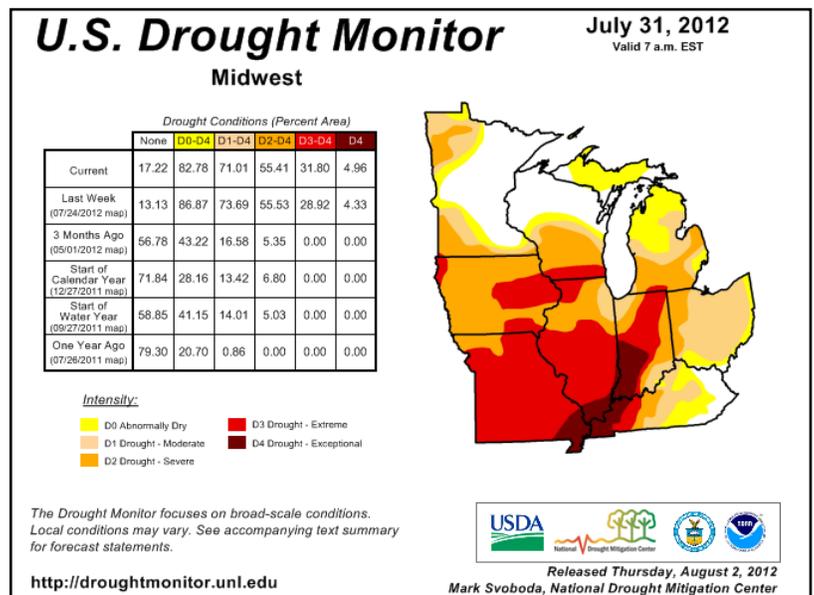


Record U.S. Drought of 2012 Poses Problems for Refiners and Motorists (Part 1)

There is no doubt that the heatwave and drought affecting the nation's midsection this summer is causing widespread pain and misery for the farmers and ranchers in the region. As the drought persists however, collateral damage may spread to U.S. refiners and motorists as well. The spreading destruction of this year's corn crop is rapidly increasing the cost of feedstock to U.S. ethanol plant producers and could conceivably reduce the amount of corn available for conversion to fuel ethanol well into 2013.

In late June the U.S. Agricultural Department (USDA) confirmed that U.S. farmers had planted more corn than in any year since 1937. Farmers throughout the Midwest took advantage of a warmer and dryer than normal spring planting season to plant about 96 million acres in corn. Moreover, the warm weather arrived earlier than usual so the fields were sown roughly two to three weeks ahead of the normal planting cycle. As a result, many industry observers concluded that 2012 would yield a record corn crop. The USDA concurred, estimating total production for this year's crop at about 14.7 billion bushels, a whopping 2.3 billion bushels more than the harvest in 2011 which also happened to be the 4th largest ever!

Now it seems that the unusually mild spring weather foreshadowed a much more ominous summer weather pattern. The National Drought Mitigation Center at the University of Nebraska – Lincoln produces a weekly national [Drought Monitor Map](#) in collaboration with the National Oceanic and Atmospheric Administration, the U.S. Department of Agriculture, and about 350 drought observers across the country. Their data shows that the drought is both spreading and intensifying throughout much of the U.S. with about 53% of the country in moderate drought or worse. For farmers in the upper Midwest where

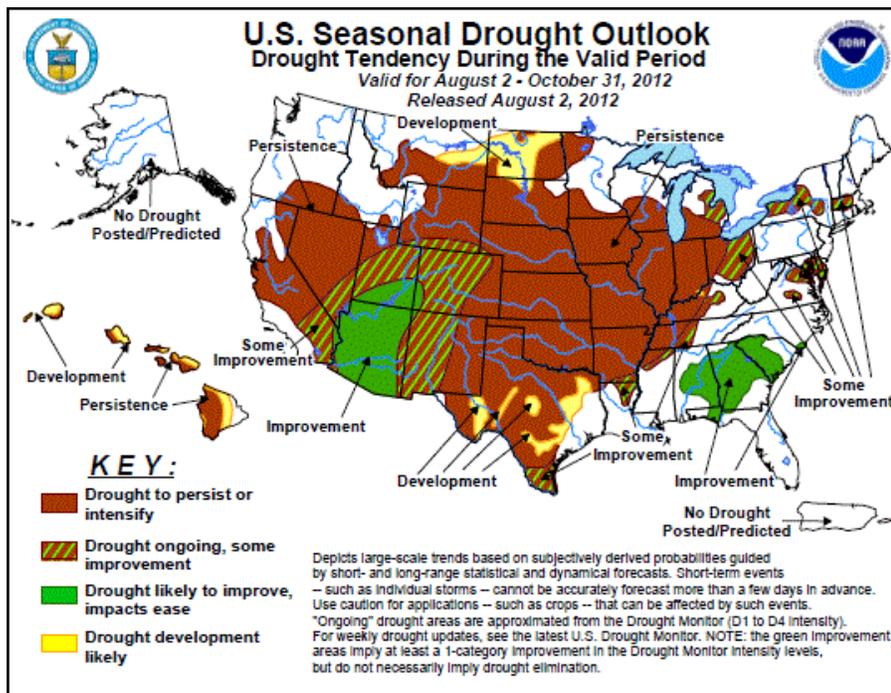


much of the nation's corn is grown, the situation is getting desperate.

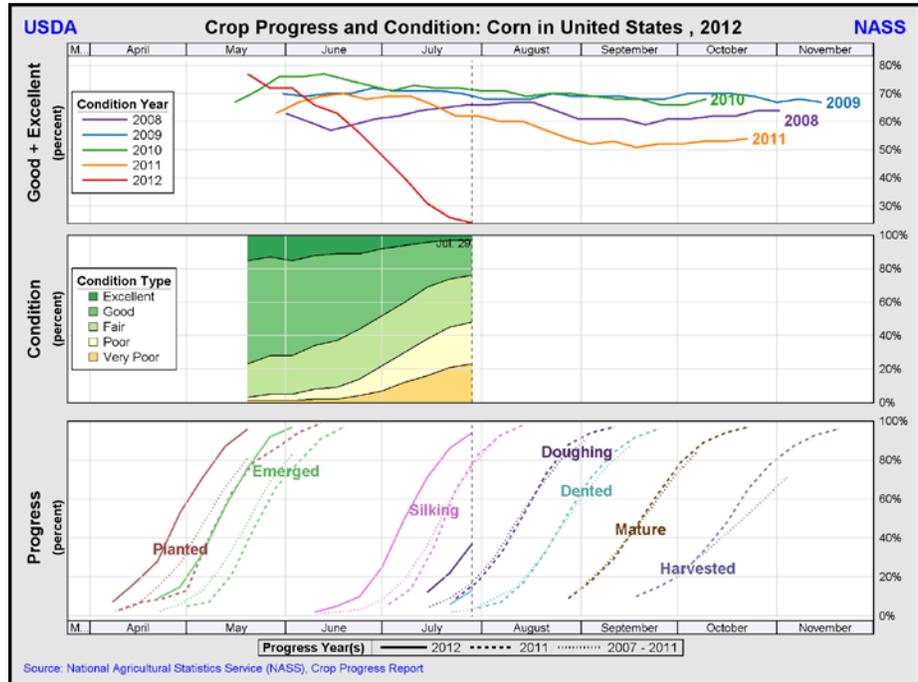
Look at the map of the Midwest to the right. It shows that nearly 71% of the Midwest is in a moderate to exceptional drought while the area designated as severe or worse has increased ten-fold versus three months ago. What's more, 7 of the top 10 corn producing states can be found on this map with only Kentucky and Michigan falling just out of the list.

The situation in the High Plains states where the other 3 largest producers can be found is even worse. Over 87% of the area covered by these states is suffering at least a moderate drought with 48% designated as extreme or worse (versus 0% three months ago). Clearly the immediate situation for U.S. corn producers is dismal but what does the future hold?

The National Weather Service climate prediction center released an updated [U.S. Seasonal Drought Outlook](#) earlier today and the forecast is discouraging to say the least. The outlook calls for drought and high temperatures to not only persist and/or intensify, but to also expand into areas that have as yet been relatively unaffected. Given this outlook (which extends through October), it looks as if prospects regarding this year's corn harvest may be dimming by the minute.



An excellent visual representation of the rapidly declining corn crop 55can be found in the weekly [Crop Progress and Condition](#) report released by the U.S. Department of Agriculture. This report rates the current corn harvest prospects for each of the top 18



producing states, representing 92% of the total 2011 production. The report breaks out total acreage planted by state according to 5 categories that range from **Very Poor** (essentially a complete or near crop failure) to **Excellent** (yield prospects above trend). The chart to the right shows the 18 state aggregate trends for each of the 5 categories since tracking for this crop began in mid-May.

The total tracked acreage planted in corn rated fair or worse now sits just below 80%. This implies that more than three quarters of the acreage that is tracked is expected to yield below trend, of which nearly 50% might be at risk of a total wipeout (The **Poor** category implies a probable heavy yield loss). For ethanol producers, the rapidly deteriorating crop conditions across the Corn Belt has to be very worrisome. Indeed, in a [report](#) released on July 11, 2012, USDA acknowledged the effect of the spreading drought by slashing their corn production forecast 1.8 billion bushels to a new total of 13.0 billion bushels.

Unfortunately, we now think the USDA's reduction may not go far enough as the drought is intensifying over some of the most productive cropland in the world. In order to come up with an adjustment to the latest [Muse 2012 Ethanol and Grain Price Forecast](#) issued in June, the USDA's Crop Progress and Condition data for each state was extrapolated and multiplied by a

unique state yield factor for each crop condition category. The adjusted yield factors were then used to estimate an expected deviation from the respective state's yield trend lines. The respective deviations were then applied to the total acreage expected to be harvested in each state to come up with a new production forecast. The results are sobering. An optimistic case scenario, assuming temperatures moderate unexpectedly and more typical rainfall patterns emerge, yielded a total corn production estimate of about 11.5 billion bushels. The pessimistic case suggested that production might drop to around 9 billion bushels. Our expected case which assumes that the acreage currently rated as **Poor** yields 50% of trend, **Fair**-rated acreage yields 75% of trend, and **Excellent**-rated acreage yields 110% of trend indicates a harvest of right at 10 billion bushels.

So what's in store for the producers and the end users of fuel grade ethanol over the next 12 to 18 months? We'll explore the possibilities in Part II.



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Tod McGreevy is a Vice President and Director at Muse, Stancil & Co. with 22 years of industry experience. Muse provides customized consulting services to the downstream energy industry, focusing on offering an integrated combination of technical and business expertise.

As a consultant, Tod has worked on a broad range of assignments in the downstream sector around the world. Many of his assignments have focused on refining economics, market analysis, and business strategy.

Prior to joining Muse in 2003, Tod worked for several U.S. refining and marketing companies including Fletcher Oil and Refining, Phibro USA, Lyondell – Citgo Refining, and El Paso Merchant Energy. Tod holds B.S. degrees in Chemical Engineering and Materials Science from the University of Connecticut.