



## Weekly Farm Economics: Range in Farm Yields during the 2012 Drought Year

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Crop yields vary considerably across farms. This range is illustrated for the 2012 drought year by examining corn yields for farms enrolled in Illinois Farm Business Farm Management (FBFM). Variability illustrates manners in which averages abstract away from the variety of results that can occur within a year. It also illustrates the importance of crop insurance in a drought year.

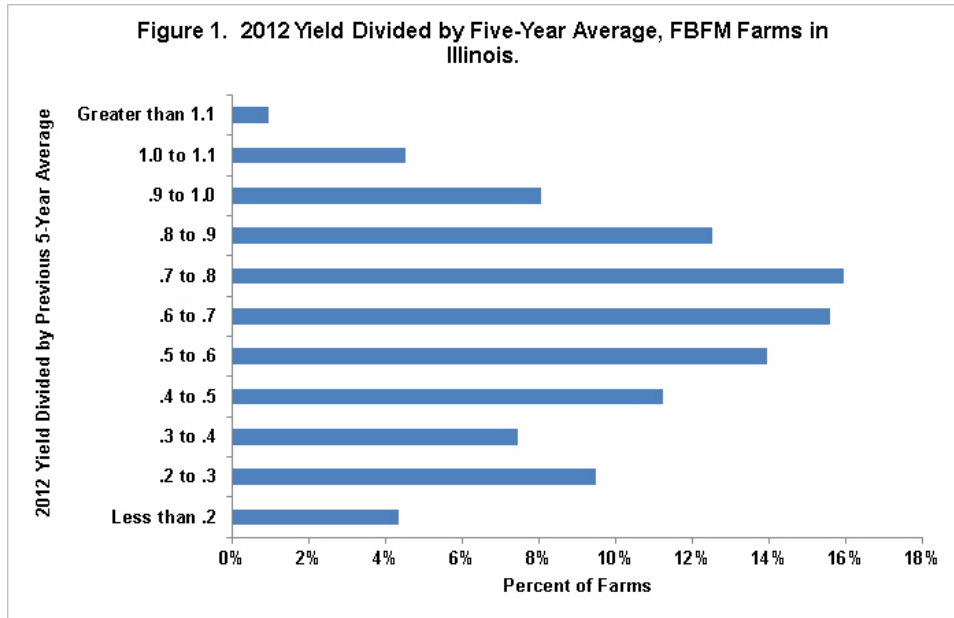
### Range in Corn Yields in Illinois

Variability in yields across farms is illustrated by calculating the 2012 yield divided by a five-year average of yields from 2007 through 2011. Take, for example, a farm that had a 190 bushel per acre average from 2007 and 2011 and a 130 bushel per acre yield in 2012. For this example, the 2012 yield divided by the previous five-year average is .68 (130 bushel 2012 yield / 190 bushel five-year average). This means that the 2012 yield is 68% of the five-year average, or there is a 32% yield loss relative to the five-year average. Using the five-year average in this manner considers differences in average yields across farms, allowing variability to be stated in terms of each farm's average yields.

There are 2,946 farms across Illinois included in this analysis. The average 2012 yield relative to the five-year average is .64. There is quite a large variability around this average (see Figure 1). At the low end, 4% of the farms have 2012 yields that are less than .2 of the five-year average, with another 9% having yields between .2 and .3 of the five-year average. There are 6% of the farms with yields above the five-year average (i.e., 2012 yield divided by five-year average values greater than 1.0).

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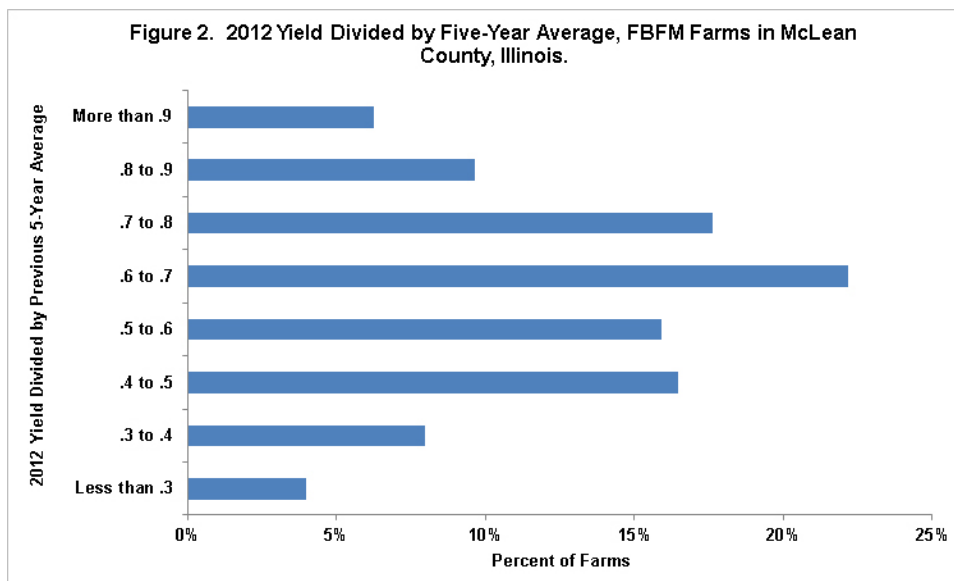
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### Range in Corn Yields in McLean County, Illinois

Some of the yield variability illustrated in Figure 1 is due to differences in the severity of the drought across Illinois. Generally, the 2012 drought was the most severe in southern Illinois and less severe in northern Illinois. However, even within a smaller geographical area, yields vary considerably.

To illustrate, Figure 2 shows yield variability for 176 farms located in McLean County, Illinois. The average 2012 yield divided by the five-year average is .61; however, similar to the state, there is a considerable range in yields. Four percent of the farms have yields that are less than .3 of the five-year average, while 6% of the farms have yields that are above .9 of the five-year average.



McLean County has less variability than the state, but not as much less as one might expect. The standard deviation of yields divided by five-year averages is .24 for all FBFM farms in Illinois, while the standard deviation is .18 for McLean County. As measured by the standard deviation, the standard

deviation is reduced by 25% (1 – .18 McLean County standard deviation / .24 state standard deviation).

### **Commentary**

Focus often is given to average yields for a state or a county. While reasonable, focuses on averages abstract away from the variability of results that occur in yields. This is particularly true in drought years, as yield variability increases in adverse conditions.

This variability then will impact financial results. In a drought year, farms with relatively high yields will have very good years, as commodity prices increase when the drought impacts the heart of the corn-belt. On the other hand, farms with less than 50% of their average yields will have poor income yields, particularly if those farms marketed grain prior to harvest. Farms that marketed grain prior to market may have to buy back bushels at a much higher market price, exasperating income problems.

Yield variability in 2012 points to the usefulness of crop insurance in protecting yields. All else being equal, those producers with lower yields would have had lower crop revenue. Crop insurance can make up these differences, evening out income results across farms with low yields

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