

March 10, 2006

FEFO 06-05

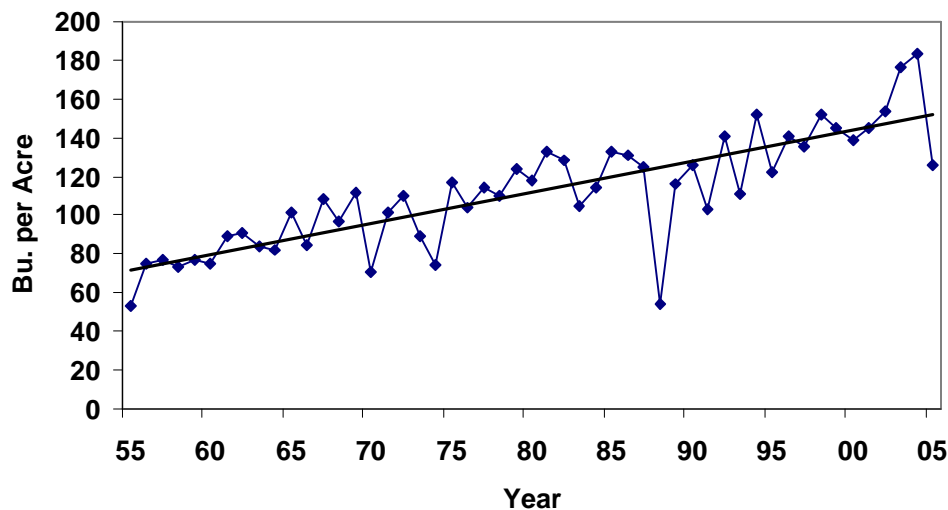
How Bad Were 2005 Corn Yields?

Some observers suggest that genetic improvements have reduced downside yield potential in corn. Dry conditions prevailed over much of Illinois in 2005, thereby providing an opportunity to evaluate whether downside potential has been reduced. In this paper, yield deviations for county yields are reported for 2005. The 2005 deviations are compared to deviations from 1955 through 2005. No county has a 2005 deviation greater than its 1988 deviation, a year that was the worst for many counties. However, deviations for some counties in 2005 are large and in the “second tier” of yield losses. While genetic improvements may have reduced yield losses, large negative yield deviations are still possible.

Percent Yield Deviations

County corn yields from 1955 through 2005 were obtained for all Illinois counties from the National Agricultural Statistical Service (NASS) website (www.nass.usda.gov). The process of calculating percent yield deviations is illustrated for Whiteside County. Actual and trend yields for Whiteside county are shown in Figure 1. Trend yields are represented by the solid line, a line giving the best statistical fit for a constant yearly increase in per bu. yields. For Whiteside County, the trend increase between 1995 through 2005 is 1.7 bu. per year.

Figure 1. Actual and Trend Yields, Corn, Whiteside County, Illinois, 1955 - 2005.



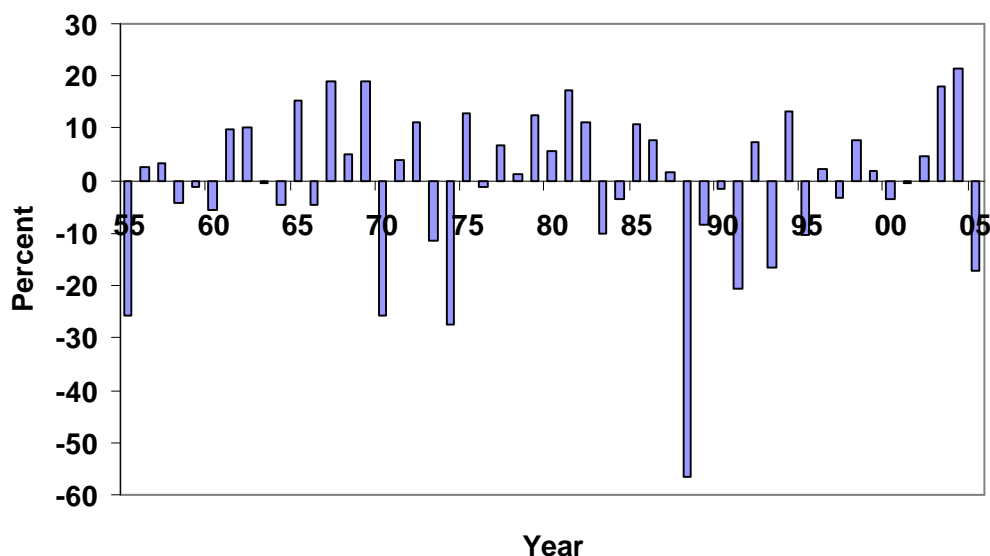
In 2005, trend yield is 152 bu. while actual yield is 126 bu. per year. A yield deviation reported here represents variation from trend yield. In 2005, the yield difference is -26 bu. (152 trend yield – 126 trend yield). The 2005 percent yield deviation is -17% (-26 yield difference divided by 152 bu. trend yield).

Calculating percent yield deviations places each year in the context of contemporary yields. Not making this adjustment would cause many prior years to look like poor yielding years. For example, the actual yield in 1956 is 75 bu. per acre, a poor year by today’s standards. Trend yield for 1956 is 73 bu. Hence, the 1956 yield is above the trend yield. The yield deviation for 1956 is 2.7% ((75 bu. actual yield – 73 bu. trend yield) / 75 bu. actual yield), indicating that 1956 is a slightly above-average year.

Whiteside County Yield Deviations

The 2005 yield deviation of -17% for Whiteside County ranks as its sixth worst yield deviation between 1995 through 2005 (see Figure 2). By far, the worst year is 1988 which has a yield deviation of -56%. Other years in which yield deviations are lower than 2005 include 1955 (-25% yield deviation), 1970 (-26%), 1974 (-28%), and 1991 (-20%). Other years with large negative deviations include 1973 (-11%), 1993 (-16%), and 1995 (-10%).

Figure 2. Percent Yield Deviation From Trend-Yield, Corn, Whiteside County Yields, 1955 - 2005.



The 2005 yield deviation is not as bad as the 1988 deviation, which surpassed all other yield deviations by 29%. A negative deviation as large as in 1988 may be a once in a lifetime event in northern and central Illinois counties. The 2005 yield however is in the second tier of worst yields where yield deviations represent at least 10% losses.

Whiteside County yield deviations are fairly typical for many Illinois counties. On average, the worst yield deviation averaged across all counties is -48%. The worst yield deviation occurs in 1988 in 43% of the counties. The next lowest yield deviation often is considerably less than the lowest deviation. Over all the counties, the second lowest deviation averages -37%, significantly better than the -48% average low. Most counties then have several losses between 10 and 35%. The frequency of losses between 10 and 35% is about 1 out of 5 years in northern and central Illinois. Southern Illinois counties have higher

frequencies of low yields. Data and graphs for other Illinois counties are available in a Microsoft Excel spreadsheet downloaded at: www.farmdoc.uiuc.edu/manage/newsletters/fefo06_05/yieldDeviation.xls

Yield deviations seem to show a pattern in which large low yielding deviations do not occur for several years (see Figure 2). Between 1996 through 2004, for example, most deviations are positive and the 2004 yield deviation of 22% is the highest between 1955 and 2005. Some have suggested that recent advances may have eliminated low yield years. However, periods of having no large negative deviations are not uncommon. The 1996-2004 period is similar to the 1961 through 1969 period and the 1975 through 1982 period. Hence, the string of good years between 1996 through 2004 may simply be due to random chance.

Percent Yield Deviations across Illinois

Percent yield deviations in 2005 vary across Illinois counties. Nine percent of the counties have yield deviations representing greater than 20% losses, 29% of the counties have yield deviations between -10% and -20%, 32% of the counties had yield deviations between -10% and 0%, while 30% of the counties have positive percent yield deviations.

Percent yield deviations show a geographical dispersion. The highest yield losses are located around Chicago and a string of western counties south of the Quad Cities (see Figure 3). In the northeast, five counties have deviations indicating losses of greater than 20%: Boone (-20%), Grundy (-20%), Kane (-23%), Dupage (-24%), Kendall (-26%), and Lake (-26%). In the west, five counties had yield deviations indicating losses greater than 20%: Scott (-20%), Menard (-22%), Knox (-24%), Stark (-25%), Peoria (-25%). Yields are near average in east-central Illinois and are above average in much of southern Illinois. Several counties in a string from Jasper County in the east to Madison County in the west also have low 2005 yields, although deviations are not as low as other areas in the state.

Having a geographical dispersion to yield losses is fairly typical. In 2002, for example, 42 counties located primarily in the southern part of Illinois had percent yield losses indicating greater than 20% losses. During that same year, 20 counties located primarily in the northern and western part of the state have positive percent yield deviations. The 2002 distribution is almost the mirror image of the 2005 distribution.

Summary

Corn yields still have downside potential. Many counties in northeast and western Illinois experienced yield deviations from trend yields of greater than 10%. The 2005 loss is the first time many of these counties had a large yield shortfall since 1995. Many counties in central and eastern Illinois have not had a large yield shortfall in recent years. The analysis here suggests that it is only a matter of time before these counties have significant losses.

This analysis does not answer whether improved genetics aid in reducing yield shortfalls. It is clear that improved and genetic modified hybrids have increased trend yields over time. It is not clear that percent yield shortfalls are reduced by improved hybrids. Having said that, some of the yields in northern and western counties may have been worse had improved or genetic modified hybrids not been in use. For example, the percent yield loss could have been greater than a 17% loss for Whiteside County had not improved genetics been available. In any case, improved hybrids have not eliminated years in which yield deviations of greater than 10% can occur.

Issued by: Gary Schnitkey and Bruce Sherrick, Department of Agricultural and Consumer Economics

Illinois - Corn, 2005

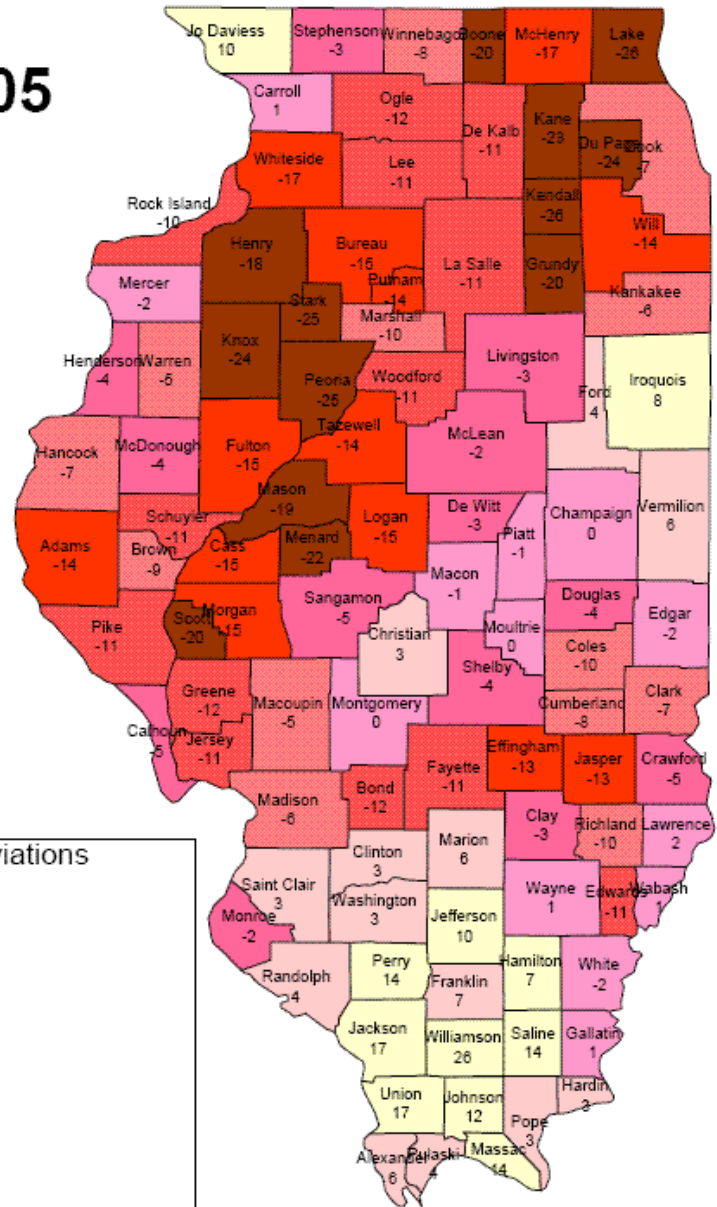


Figure 3. Percentage Yield Deviations

| | |
|----------------|-------|
| -27 to -17, 13 | 12.7% |
| -17 to -12, 13 | 12.7% |
| -12 to -10, 13 | 12.7% |
| -10 to -5, 13 | 12.7% |
| -5 to -2, 13 | 12.7% |
| -2 to 3, 13 | 12.7% |
| 3 to 7, 13 | 12.7% |
| 7 to 27, 11 | 10.8% |