FARM BUSINESS MANAGEMENT

FARM ECONOMICS Facts & Opinions

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CAN 1988 DROUGHT YIELDS OCCUR AGAIN IN NORTHERN AND CENTRAL ILLINOIS?

Questions have been raised whether widespread low yields have been eliminated in northern and central Illinois. It has been suggested that a drought in 2003 would not cause yields to decline as much as happened during the 1988 drought. Arguments include the fact that corn hybrids and soybean varieties have improved and can now withstand more adverse conditions. Within recent years, county yields in northern and central Illinois have been relatively stable, suggesting that low yields are less likely to occur. In addition, some areas in northern and central Illinois had low rainfall in 2002. In many of these areas, yields were only slightly below average suggesting that yields have become less sensitive to adverse weather.

Counterpoints to the above arguments include the low yields that occurred in many parts of southern Illinois in 2002. Some parts of central Illinois in Macon, Piatt, and southern McLean Counties also had below average yields. In my opinion, one of the best counterpoints is what happened to 2002 yields in Ohio. Ohio had a widespread drought in 2002 that resulted in an average corn yield of 88 bu. per acre, down by 58 bu. from the year before. Below a comparison is made between county yields in Champaign County, Illinois and Champaign County, Ohio, two counties that are large corn and soybean producing counties.

Champaign County, Illinois and Ohio

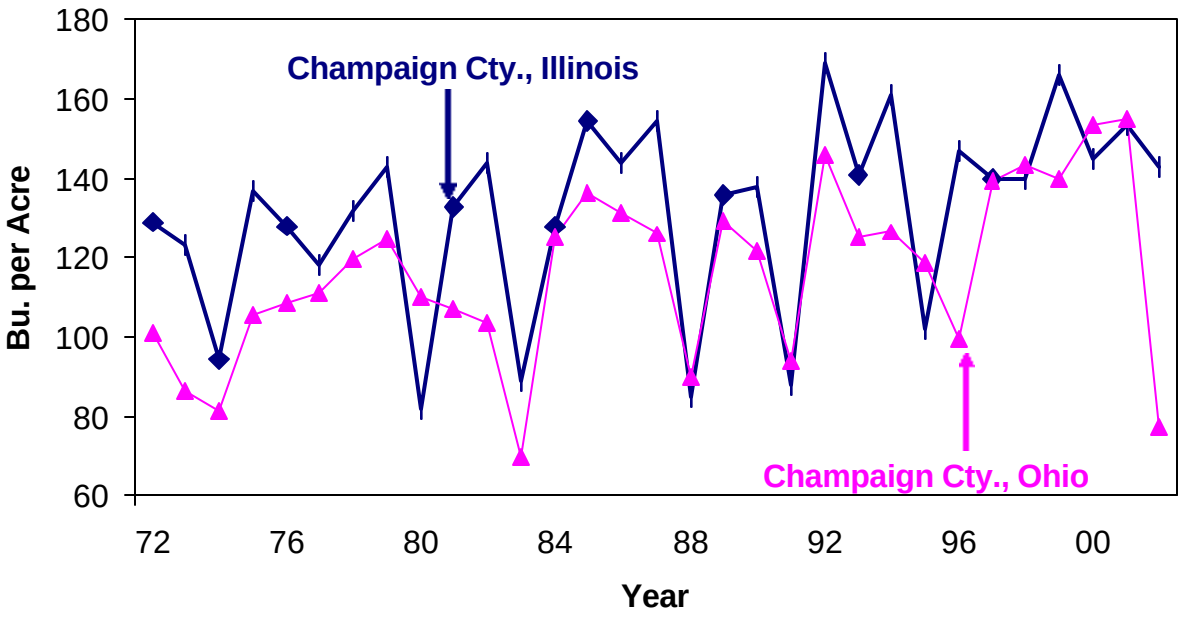
Champaign County, Ohio is located in west-central Ohio. It is one county north of Interstate 70 which runs between Indianapolis and Columbus, Ohio. This places Champaign County, Ohio and Champaign County, Illinois on about the same longitude. In term of weather, Champaign County, Ohio has slightly more rainfall and slightly lower temperatures during the summer when compared to Champaign County, Illinois.

Between 1992 and 2001, the average county yield in Champaign County, Ohio was 135 bu. per acre compared to 146 bu. per acre in Champaign County, Illinois (see Figure 1). Overall, average soil productivity is higher in Champaign County, Illinois causing the Illinois County to have an 11 bu. higher yield. Between 1997 and 2001, however, the two counties had roughly the same yields with Champaign County, Ohio averaging 146 bu. compared to 148 bu. for Champaign County, Illinois.

Prior to 2002, objective measures would suggest that Champaign County, Ohio had lower variability than Champaign County, Illinois. The standard deviation – a measure of dispersion – for Champaign County, Ohio was 21 using data from 1972 to 2001 compared to 24 for Champaign County, Illinois.

In summary, an analysis of corn yields prior to 2002 would suggest that Champaign County, Ohio is less productive than Champaign County, Illinois. Some individuals might have suggested that Champaign

Figure 1. County Corn Yields in Champaign County Illinois and Ohio, 1972-2002.



County, Ohio was catching up with Champaign County, Illinois, given similarity in yields between 1997 and 2002 (see Figure 1). Overall, yields between 1972 through 2001 were less variable in the Ohio County compared to the Illinois County.

2002 Yields

The 2002 yield in Champaign County, Ohio was 77 bu. per acre. By any measure, the 2002 yield was a disaster for the Ohio County. The 2002 yield was 77 bu. below the County's 2001 yield. Since 1972, Champaign County, Ohio's yield was lower only in one year: 70 bu. in 1983 (see Figure 1). The 2002 County yield was 47 percent below its five-year average yield, its highest percentage decline in the period shown in Figure 1. The next highest percentage from its five-year average yield occurred in 1983 and was 38 percent.

In terms of percent decline from its five-year average yield, Champaign County, Illinois has not had as large a decline as did Champaign County, Ohio. Its largest percentage decline occurred in 1980. In that year, Champaign County, Illinois' yield was 38 percent below the five-year average yield, exactly the same percent decline as Champaign County, Ohio's highest decline prior to 2002.

Farmers in Champaign County, Ohio and Champaign County, Illinois plant hybrids with the same genetic potential. Yields in Champaign County, Ohio were low because of low rainfall and high temperatures. As shown in Table 1, low yields in either county tend to occur when rainfall is lower than average and temperatures are higher than average during the summer months.

Soybeans in Champaign County, Ohio also had a large yield decline in 2002. The County average yield was 25 bu. per acre, down by 42 percent from its five-year average yield of 44 bu. per acre. This suggests that soybeans – like corn – can be adversely affected by poor weather.

Table 1. Rainfall and Maximum Temperature Date, Urbana, Illinois and Ohio.

Year [1]	County Yield	Total Precipitation in: June	July	Aug	Summer[2]	Average Daily Max. Temp. June	July	Aug
Panel A.	Urbana, Illinois							
		---------- Inches ----------				--------- Degrees F ------		
Average[3]	134	4.2	4.2	4.3	12.6	83	86	84
1980	82	4.6	1.4	4.2	10.2	81	90	87
1983	89	9.2	1.4	4.6	15.2	83	90	89
1988	85	0.3	3.6	1.3	5.2	88	91	90
1991	88	0.7	2.6	2.3	5.6	87	88	87
1995	102	1.9	2	5.4	9.3	84	88	88
1996	147	5.7	3.4	1.4	10.5	82	83	84
2002	143	2.8	2.7	7.7	13.2	84	90	85
Panel B.	Urbana, Ohio							
	(bu./acre)	---------- Inches ----------				--------- Degrees F ------		
Average[3]	120	4.9	4.5	5.4	13.3	80	85	83
1980	110	8.1	3.7	5.6	17.4	79	85	85
1983	70	4.0	2.8	5.0	11.8	80	88	89
1988	90	1.1	3.9	4.2	9.2	83	87	85
1991	94	2.4	2.4	1.5	6.3	83	86	84
1995	119	5.0	8.5	7.9	21.4	81	85	87
1996	100	3.3	8.3	0.1	11.7	81	83	84
2002	77	4.9	1.6	2.7	9.2	84	89	87

[1] Years selected because of a below average yield in either Champaign County, Illinois or Champaign County, Ohio.

[2] Sum of June, July, and August.

[3] Average from 1980 through 2002.

Source: National Climate Data Center Website:
(http://nndc.noaa.gov/?http://ols.nndc.noaa.gov/plolstore/plsql/olstore.prodspecific?prodnum=C00504-TAP-A0001)

Summary

Weather has a large impact on yields. A drought in northern and central Illinois will cause significant yield declines. Given evidence from Ohio, these yield declines could be as large or larger in percentage terms than those that occurred in the recent past.

It is likely that hybrids from prior years would perform worse in a drought. For example, Champaign County, Ohio's yield could have been lower in 2002 if 1988 hybrids had been used in 2002. However, the cost structure in 2003, as reflected in cash rents, is based on higher expected yields. Hence, a large percent decline in 2003 is likely to have the same impact on financial structure as a similar percent

decline ten years ago.

Often, individuals place too much weight on current years when judging the probability of adverse events. Recently, northern and central Illinois have not seen large yield declines. It is likely that this is more a matter of chance than a change in the probabilities of low yields.

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