

**December 6, 2007****FEFO 07-18****Projected Corn and Soybean Returns in 2008**

Significantly higher costs for corn production may cause some farmers to switch acres from corn to soybeans. In this paper, returns are projected for 2008. Corn returns minus soybean return, hereafter referred to as corn-minus-soybean-returns, indicate that corn production may have higher returns than soybean production on high-productivity farmland in 2008. However, returns will vary across farms. Projected 2008 corn-minus-soybean returns are roughly similar to averages observed from 2004 to 2007.

**Corn-Minus-Soybean>Returns from 2004 to 2007**

Corn-minus-soybean-returns were calculated for northern, central, and southern Illinois. Central Illinois was further divided into high-productivity farmland and low-productivity farmland categories. Between 2004 and 2007, corn yields averaged 183 bushels for the central Illinois farms with high productivity farmland and 166 bushels for the central Illinois farms with low productivity farmland.

Returns from 2004 through 2006 were summarized from farms enrolled in Illinois Farm Business Farm Management (FBFM). To be included in this study, a farm had to receive a majority of its income from grain operations. Returns for 2007 are not final and are based on yield, price, and cost estimates. The 2007 results will become “final” when FBFM records are summarized in 2008.

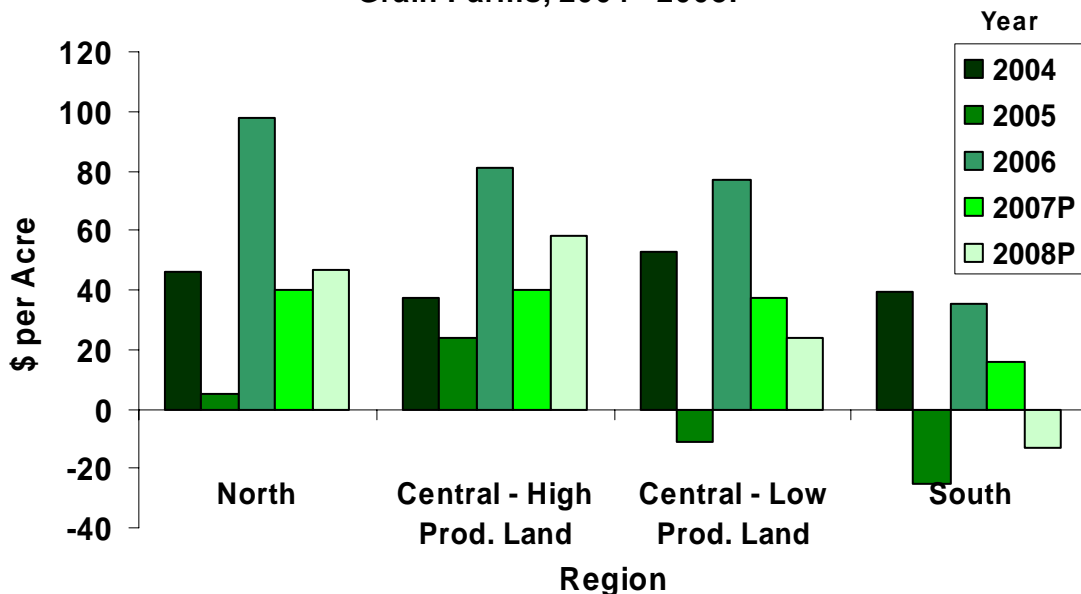
Both corn and soybean returns represent averages. Corn, for example, represents an average of production from corn-after-soybeans (corn where the proceeding crop was soybeans) and corn-after-corn (corn production where the proceeding crop was corn).

Figure 1 shows corn-minus-soybean-returns for the four Illinois categories. In most cases, corn-minus-soybean-returns were positive, meaning that corn returns were higher than soybean returns. Only in 2005 did soybean returns exceed corn returns in two cases: central Illinois with low-productivity farmland and southern Illinois.

Of the years shown, corn-minus-soybean-returns were the lowest in 2005. In that year, corn-minus-soybean-returns were \$5 per acre for northern Illinois, \$24 for central Illinois with high-productivity farmland, -\$11 for central Illinois with low productivity, and -\$25 for southern Illinois. In 2005, corn yields were below average while soybean yields were near average.

Corn-minus-soybean-returns were the highest in 2006, averaging \$98 for northern Illinois, \$81 for central Illinois with high-productivity farmland, \$77 for central Illinois with low-productivity farmland, and \$35 in southern Illinois. Both corn and soybean yields were above average in 2006 and prices increased substantially over historically average levels. In percentage terms, corn price increased more than soybean price in 2006.

**Figure 1. Corn Minus Soybean Returns on Illinois FBFM Grain Farms, 2004 - 2008P**



Average corn-minus-soybean-returns from 2004 through 2007 were higher for northern Illinois (\$47 per acre) and central Illinois with high-productivity farmland (\$46 per acre) than for central Illinois for low-productivity farmland (\$39 per acre) and southern Illinois (\$16 per acre). Observed differences in returns tend to follow land productivity, with higher productivity farmland having higher corn-minus-soybean-returns. In general, corn yields increase more on higher productivity farmland than do soybean yields. This causes corn returns to exceed soybean returns the higher the productivity of the farmland.

### Budgets for 2008

Figure 1 shows projected corn-minus-soybean-returns for 2008. Corn-minus-soybean-returns are projected positive for northern Illinois (\$47 per acre), central Illinois with high-productivity farmland (\$58 per acre), and central Illinois with low-productivity farmland (\$24 per acre). In southern Illinois, soybean returns are projected more profitable than corn (-\$13 per acre corn-minus-soybean return).

More detail on corn and soybean returns are shown in Table 1. This table summarizes budgets in the management section of *farmdoc* ([www.farmdoc.uiuc.edu](http://www.farmdoc.uiuc.edu), the direct link is [http://www.farmdoc.uiuc.edu/manage/crop\\_budgets.pdf](http://www.farmdoc.uiuc.edu/manage/crop_budgets.pdf)). These budgets break out corn production into corn-after-soybeans and corn-after-corn categories. Corn-after-corn is assumed to have a 10 bushel per acre yield drag compared to corn-after-soybeans. Corn-after-corn costs are higher to account for higher fertilizer costs.

In northern and central Illinois, a fairly “standard” rotation has been a 50% corn – 50% soybean rotation in which corn is grown on farmland that was planted in the previous year to soybeans and vice versa. In recent years, much of the decision has been whether to switch away from a 50% corn – 50% soybean rotation to one that includes more corn. This switch requires growing corn on farmland that had been planted to corn in the previous year. From an economic viewpoint, the decision to plant more corn revolves around a comparison of corn-after-corn and soybean returns.

In northern Illinois and central Illinois high-productivity categories, corn-after-corn is projected to be more profitable than soybeans in 2008. Corn-after-corn in northern Illinois is projected to have \$291

operator and farmland return compared to \$270 for soybeans, a difference of \$21 per acre. Corn-after-corn in central Illinois with high productive farmland category has a projected \$344 per acre return while soybeans have a \$312 per acre, a difference of \$32 per acre. This suggests that planting corn will be more profitable than planting soybeans.

In the central Illinois with low-productivity corn category, corn-after-corn has an operator and farmland return of \$271 per acre. The corn-after-corn is \$20 lower than the soybean return of \$291 per acre. This suggests that planting soybeans on farmland that was previously planted to corn will be more profitable than planting corn for farmland with this productivity.

In southern Illinois, operator and farmland return for soybeans is projected at \$232 per acre. Soybeans returns are higher than for either corn-after-soybeans (\$226 per acre) or corn-after-corn (\$173 per acre). This suggests planting soybeans will be more profitable in southern Illinois.

### Caveats to Planting Corn-After-Corn

Similar to the last several years, budgets suggest that planting corn-after-corn will be more profitable than planting soybeans in regions with high-productivity farmland. When making planting decision, four caveats should be considered:

1. Commodity prices will determine the relative profitability of corn and soybeans. Recently, there has been a great deal of market volatility that impacts relative corn and soybean profits.

An example of these impacts is illustrated by the break-even soybean prices shown in Table 2. Soybean prices above the prices shown in Table 2 will cause soybeans to be more profitable than corn-after-corn. In northern Illinois, the break-even soybean price is \$9.60 per bushel given a corn price of \$3.75. This means that soybeans will be more profitable for a soybean price above \$9.60. The soybean price increases to \$10.45 per bushel for a \$4.00 corn price.

**Table 1. Crop Budgets for Illinois, 2008.**

	Corn-after -Soybeans	Corn-after -Corn	Soybeans
<b>Panel A. Northern Illinois</b>			
Yield (\$ per acre)	183	173	51
Price (\$ per bushel)	\$3.75	\$3.75	\$9.20
Total revenue (per acre) <sup>1</sup>	\$715	\$678	\$498
Non-land costs (per acre)	<u>373</u>	<u>387</u>	<u>228</u>
Operator and land return	\$342	\$291	\$270
<b>Panel B. Central Illinois (high-productivity farmland)</b>			
Yield (\$ per acre)	191	181	54
Price (\$ per bushel)	\$3.80	\$3.80	\$9.25
Total revenue (per acre) <sup>1</sup>	\$753	\$715	\$527
Non-land costs (per acre)	<u>357</u>	<u>371</u>	<u>215</u>
Operator and land return	\$396	\$344	\$312
<b>Panel C. Central Illinois (low-productivity farmland)</b>			
Yield (\$ per acre)	173	163	52
Price (\$ per bushel)	\$3.80	\$3.80	\$9.25
Total revenue (per acre) <sup>1</sup>	\$682	\$644	\$506
Non-land costs (per acre)	<u>359</u>	<u>373</u>	<u>215</u>
Operator and land return	\$323	\$271	\$291
<b>Panel D. Southern Illinois</b>			
Yield (\$ per acre)	148	138	47
Price (\$ per bushel)	\$3.85	\$3.85	\$9.30
Total revenue (per acre) <sup>1</sup>	\$589	\$550	\$456
Non-land costs (per acre)	<u>363</u>	<u>377</u>	<u>224</u>
Operator and land return	\$226	\$173	\$232

<sup>1</sup> Includes government payments.

Source: Crop budgets in mangement section of farmdoc (www.farmdoc.uiuc.edu).

2. Costs used to conduct this analysis are averages. Individual farms can vary from these averages. Hence, farms should use their own costs when analyzing cropping decisions. This year costs across farms vary more than usual because of highly variable fertilizer prices. Individuals who have waited to purchase fertilizer may face substantially higher costs than those who pre-ordered or purchased fertilizer earlier in the year.

**Table 2. Break-Even Soybean Prices for Different Corn-After-Corn to Have Same Return as Soybeans.<sup>1</sup>**

Corn Price	Northern Illinois	Central Illinois		Southern Illinois
		High Productivity	Low Productivity	
		\$ per Bushel		
3.00	7.06	7.17	6.38	5.55
3.25	7.91	8.00	7.17	6.29
3.50	8.75	8.84	7.95	7.02
3.75	9.60	9.68	8.74	7.76
4.00	10.45	10.52	9.52	8.49
4.25	11.30	11.36	10.30	9.22
4.50	12.15	12.19	11.09	9.96

<sup>1</sup> Break-even soybean prices calculated using yields and costs shown in Table 1.

3. Costs in budgets are assumed constant as acres in respective crops change. For example, power costs are constant whether one acre or 200 acres are planted to corn-after-corn. Planting more corn may necessitate equipment changes that could increase costs. If costs increase with more corn-after-corn, the advantages of planting of more corn will be less than those illustrated in the budgets.
4. Planting decisions in 2008 can have profitability impacts in 2009. Due to a yield drag and higher costs, corn-after-corn is projected to be less profitable than corn-after-soybeans. Planting more corn in 2008 could result in more corn-after-corn in 2009, thereby lowering yields. The *FAST* spreadsheet called the *Corn-Soybeans Rotation Tool* allows rotational comparisons to be made.

## Summary

Budgets indicate that corn production will be more profitable than soybean production in northern and central Illinois. Soybeans are projected more profitable in southern Illinois. Farms that have highly productive farmland may find corn-after-corn more profitable in 2007 than soybeans. Changes in commodity prices could change relative profitability.

## Acknowledgments

Data used in this study comes from the local Farm Business Farm Management (FBFM) Associations across the State of Illinois. Without their cooperation, information as comprehensive and accurate as this would not be available for educational purposes. FBFM, which consists of 6,000 plus farmers and 60 professional field staff, is a not-for-profit organization available to all farm operators in Illinois. FBFM field staff provides on-farm counsel with computerized recordkeeping, farm financial management, business entity planning and income tax management. For more information, please contact the State FBFM Office located at the University of Illinois Department of Agricultural and Consumer Economics at 217-333-5511 or visit the FBFM website at [www.fbfm.org](http://www.fbfm.org).

Issued by: Gary Schnitkey and Dale Lattz, Department of Agricultural and Consumer Economics