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CORN PROFITS VERSUS SOYBEAN PROFITS IN 2009

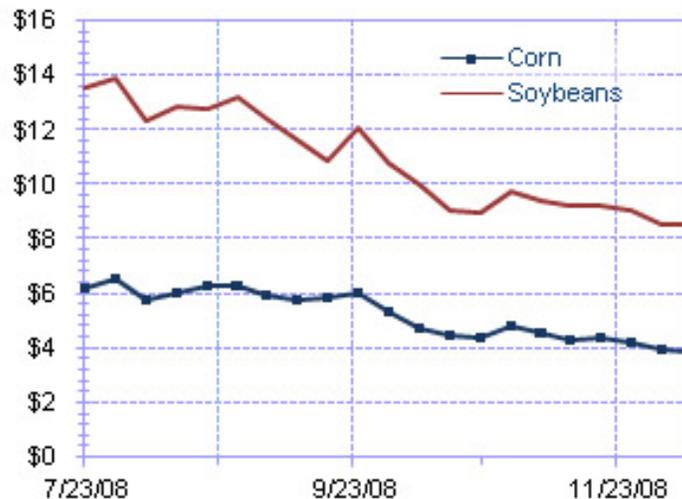
Corn and soybean prices have declined as the U.S. financial crisis became apparent in the middle of September. Besides reducing profits, price changes have caused expected relative profits of 2009 corn and soybean production to change. In this article, basis-adjusted prices of Chicago Board of Trade (CBOT) futures contracts were used to project corn and soybean profits for 2009. During July and August 2008, projections made using CBOT basis-adjusted prices indicated that 2009 corn production was expected to be over \$100 per acre more profitable than soybeans in northern and central Illinois. Using December 2009 CBOT prices, soybeans were projected more profitable than corn.

Calculation of Projected Corn-Minus-Soybean Returns

Relative profits of corn and soybeans are quantified using projected corn-minus-soybean returns. Corn-minus-soybean returns equal corn returns minus soybean returns. Positive numbers indicate that corn is projected to be more profitable than soybeans while negative numbers indicate that soybeans are projected to be more profitable than corn. A \$31 projected corn-minus-soybean return indicates that corn is \$31 per acre more profitable than soybeans.

Corn-minus-soybean returns were projected weekly using Wednesday settlement prices on CBOT contracts. Calculating weekly returns allows tracking of how relative profits change over time. Settlement prices were collected on the December 2009 corn contract and the November 2009 soybean contract. As can be seen in Figure 1, prices for both contracts have declined since summer. CBOT corn prices declined from a high of \$7.34 per bushel on June

Figure 1: Chicago Board of Trade Settlement Prices for the Dec. 2009 Corn and 2009 Nov. Soybean Contracts



25th to \$3.94 on December 3rd, a decline of \$3.40 from the June 25th high. November soybean contract prices declined from a high of \$15.38 on June 25th to \$8.55 on December 3rd, a decline of \$6.04 per bushel. On December 3rd, settlement prices were \$3.94 for the December 2009 CBOT corn contract and \$8.54 for the November 2009 CBOT soybean contract. From each of these futures prices, a \$.50 basis was subtracted to arrive at expected harvest cash prices. Projected cash prices were \$3.45 for corn (3.95 CBOT futures price - \$.50 basis) and \$8.04 for soybeans (\$8.54 CBOT futures price - .50 basis).

Yield and costs used in calculating corn-minus-soybean returns came from *2009 Crop Budgets* contained in the management section of *farmdoc* (www.farmdoc.uiuc.edu). Yields represent expected yields for 2009 and are based on trend-line projections from historical yields. Costs are based on input prices collected during the fall of 2008. Corn-minus-soybean returns were projected for northern Illinois, central Illinois for farms with high-productivity farmland, central Illinois for farms with low-productivity farmland, and southern Illinois (see Table 1 for yields and costs per region).

Table 1. Projected Yields and Costs for Regions of Illinois, 2009.

	Northern Illinois	Central Illinois		Southern Illinois
		High Productivity Farmland	Low Productivity Farmland	
Expected 2009 Yields	Bushels per Acre			
Corn	180	191	171	151
Soybeans	51	54	50	47
2009 non-land costs	\$ per acre			
Corn	579	568	577	555
Soybeans	331	326	328	313

Source: Historic Corn and Soybean Returns in the management section of *farmdoc* (www.farmdoc.uiuc.edu)

On December 3rd, corn returns for central Illinois farms having high-productivity farmland were projected at \$89 per acre based on a \$3.44 expected corn price (see calculation above), a 191 bushel expected yield, and \$568 of non-land costs (\$89 corn return = \$3.44 expected corn price x 191 bushel expected yield - \$568 non-land costs). Soybean returns were calculated using a yield of 54 bushels per acre and \$326 of costs, giving a return of \$108 per acre (\$108 return = \$8.03 expected soybean price x 54 bushel expected yield - \$326 non-land costs). On December 3rd, expected corn-minus-soybean return equals -\$19 per acre (\$89 corn return - \$108 soybean return), indicating that soybeans are projected to be \$19 per acre more profitable than corn.

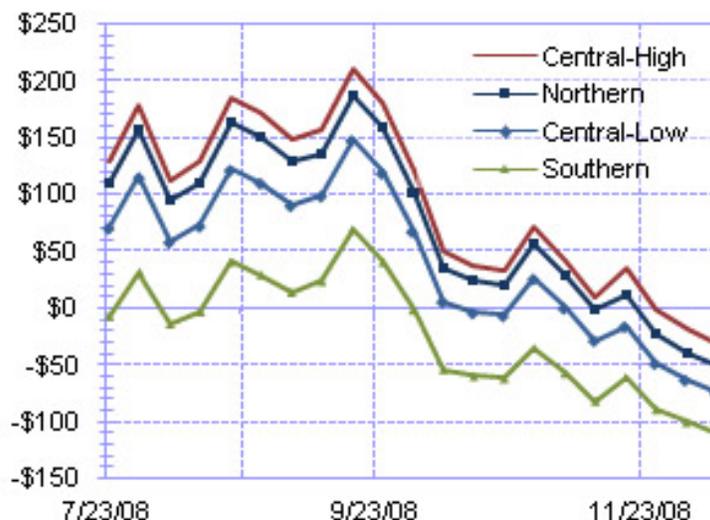
Projected Corn-Minus-Soybean Returns

For central Illinois high-productivity farmland, projected corn-minus-soybean returns averaged \$153 per acre during the months of July and August (see Figure 2). These projections indicated that corn would be much more profitable

than soybeans. The \$153 projection was considerably above the 2000-2007 historical average of \$42 per acre. Hence the \$153 projection is more than 3.5 times higher than the historical average.

Since the summer, projected corn-minus-soybean returns have declined (see Figure 2). On December 3rd, projected corn-minus-soybean returns were -\$21 for central Illinois high-productivity farmland, a decline of \$174 per acre from the July-August average. The -\$21 projection is below the historical average for the 2000-2007 period.

Figure 2: Projected 2009 Corn-Minus-Soybean Returns Given Prices Based on CBOT Settlement Prices.



As the same expected prices are used for all regions, all regions for which projections were made faced the same declining trend in corn-minus-soybean returns (see Figure 2). The differences in corn-minus-soybean returns across regions remained the same across time. On December 3rd, for example, projected corn-minus-soybean returns were -\$19 per acre for central Illinois with high-productivity farmland, -\$39 for northern Illinois, -\$63 for central Illinois with low-productivity farmland, and -\$100 for southern Illinois. In general, differences occur because of farmland productivity differences, with more productive farmland having higher projected corn-minus-soybean returns. Corn yields increase relatively more with farmland productivity than soybean yields.

Outlook for 2009 Corn Acreage

Many outlooks are expecting planted corn acres to increase in 2009. At a December 3rd *Farm Journal* conference, for example, Joe Glauber – the chief economist for the U.S. Department of Agriculture – indicated that the U.S.D.A. expects U.S. corn acres to total 90 million in 2009. This 2009 projection represents an increase of 4 million acres over the 86 million acres occurring in 2008. If it occurred, the 90 million acres would be the second highest number of corn acres during the last 30 years, only falling behind 2007 plantings of 94 million acres.

Corn acres may increase in 2009. However, current expected return projections do not indicate a shift to more corn acres in Illinois. If anything, return projections indicate that more soybean acres will be planted in Illinois relative to corn. Moreover, the above projected corn-minus-soybean returns are for Illinois, a state that with a relative advantage in producing corn over soybeans. It is likely that areas in the corn-belt outside Illinois and Iowa will have corn-minus-soybean returns nearer projections for central Illinois low-productivity and southern Illinois regions. Hence, areas outside northern and central Illinois likely will see larger soybean return advantages over corn than are

shown in the above projections. Again, these expected return projections are not consistent with increases in corn acres.

If 90 million acres of corn will be planted in the U.S., it's likely that corn returns will have to increase relative to soybean returns. This could occur because of cost decreases. In recent months, fertilizer prices have declined. Generally, fertilizer price declines favor corn production over soybean production. Fertilizer prices used in calculating the above expected corn-minus-soybean returns were \$1,000 per ton for anhydrous ammonia, \$1,000 for diammonium phosphate (DAP), and \$900 for potash. For northern and central Illinois, each \$100 decline in anhydrous ammonia price will increase corn-minus-soybean return by \$8.95, each \$100 decline in DAP price will increase corn-minus-soybean return by \$3.55, and each \$100 decrease in potash price will increase corn-minus-soybean returns by \$1.85.

The anhydrous ammonia price has the largest impact on projected corn-minus-soybean returns. If average prices for anhydrous ammonia moved from \$1,000 per ton to \$600 per ton, projected corn-minus-soybean returns on December 3rd would increase by \$36. For central Illinois farms with high-productivity farmland, expected corn-minus-soybean returns would equal \$17 per acre, still below the \$42 average from 2000 to 2007. The remaining regions would have negative expected corn-minus-soybean returns: -\$3 for northern Illinois, -\$27 for central Illinois low-productivity farmland, and -\$64 for southern Illinois.

Cost decreases will cause corn returns to increase relative to soybean returns. Even given cost decreases, however, corn prices need to increase relative to soybean prices before expected corn-minus-soybean returns approach historical levels.

Summary

Recent price changes on CBOT contracts have favored soybean production over corn production in 2009. If corn plantings are to increase in 2009, costs likely will have to decline and corn prices increase relative to soybean prices. If corn acres do not increase in 2009, corn prices could increase relative to soybean prices after planting to ration corn use. Stated alternatively, the current levels of expected corn-minus-soybean returns observed in early December may not be sustainable and the question is whether the expected corn-minus-soybean returns change before planting to induce planting more corn acres or after planting.

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