FARM BUSINESS MANAGEMENT

FARM ECONOMICS Facts & Opinions

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Corn versus Soybean Returns in 2008

How many acres of corn and soybeans will be planted this year is of great interest and could impact relative corn and soybean prices. Most projections indicate fewer corn acres and more soybean acres will be planted in 2008 as compared to 2007.

Relative profitability of corn and soybeans may impact acreage decisions. Given current cash bids for fall delivery, our analysis suggests that corn will be more profitable than soybeans in 2008 on many farms in Illinois. This analysis is conducted by calculating expected corn and soybean revenues for each Crop Reporting District in Illinois. Differences in corn and soybean revenue then are compared to differences in non-land production costs. Across all Districts, corn is projected to be more profitable than soybeans based on harvest bids as of March 20th.

Projected Corn and Soybean Revenue by Illinois Crop Reporting District

Table 1 shows projected corn revenue and soybean revenue for each Crop Reporting District in Illinois. Expected revenue for each crop equals expected yield times a new-crop bid price for fall delivery. Expected yields are based on historical yields from 1972 through 2007. Using this historical data, a trend-line is constructed for each Crop Reporting District. Expected 2008 yields are found by projecting the trend-line forward into 2008. For example, the Central District yield of 173 bushels is based on a trend-line indicating that yields increase an average of 1.9 bushels per year, resulting in a 2008 expected yield of 173 bushels per acre.

Prices are average overnight bids on March 20th for fall delivery of new crops as reported by the Illinois Department of Agriculture. These prices vary across the Districts. For corn, prices range from a low of $4.69 for the West Southwest District to a high of $4.90 per bushel for the Central District. For soybeans, prices range from $10.61 for the Southwest West District up to $11.06 for the Central District.

Expected revenues vary across the districts, primarily due to differences in expected yields. For corn, expected revenues range from a low of $631 for the Southwest District to a high of $848 per acre for the Central District. For soybeans, expected revenues range from a low of $389 per acre for the Southwest District to a high of $575 per acre for the Central District.

Corn minus soybean revenues are reported in the last column of Table 1. All corn minus soybean revenues exceed $230 per acre. The lowest difference is $230 per acre in the Southeast district. The largest difference is $277 in the West Southwest District.

Table 1. Projected Corn and Soybean Revenue by Illinois Crop Reporting District, 2008.

Crop Reporting District	Corn Exp. Yield[1]	Corn Price[2]	Corn Exp. Revenue[3]	Soybeans Exp. Yield[1]	Soybeans Price[2]	Soybeans Exp. Revenue[3]	Corn Minus Soybean Revenue
	Bu.	$/bu.	$ / acre	Bu.	$/bu.	$ / acre	$ / acre
Northeast	167	4.78	798	50	10.64	532	266
Northwest	161	4.78	770	47	10.64	500	270
West	167	4.70	785	49	10.61	520	265
Central	173	4.90	848	52	11.06	575	273
East	164	4.86	797	50	10.78	539	258
West Southwest	166	4.69	779	47	10.69	502	277
East Southeast	150	4.85	728	44	10.78	474	254
Southwest	130	4.85	631	36	10.80	389	242
Southeast	132	4.85	640	38	10.80	410	230

[1] Based on a linear trend model fit to Crop Reporting District data from 1972 to 2007.

[2] Overnight bids for 2008 crop, fall delivery on March 20, 2008.

[3] Equals expected yield x price.

[4] Equals expected revenue for corn minus expected revenue for soybeans.

Revenue Differences Compared to Cost Differences

If corn costs minus soybean costs are less than the above revenue differences, corn will be projected to be more profitable than soybeans. Table 2 shows corn and soybean budgets for Central Illinois farms with high-productivity farmland. Difference in corn and soybean costs for northern and southern Illinois are of similar magnitudes to those for central Illinois.

The first two columns show historic results for farms enrolled in Illinois Farm Business Farm Management (FBFM) averaged for the years 2001 through 2005. During this period, non-land costs averaged $257 per acre for corn and $171 for soybeans. Corn minus soybean costs equaled $86 per acre.

The middle columns show budgets for 2008 prepared in the fall of 2007 using commodity and fertilizer prices prevalent during the fall. In the fall, non-land production costs were projected at $364 for corn and $215 for soybeans, giving a $149 difference in corn and soybean costs. The $149 per acre difference in costs is higher than the $86 difference in costs between 2001 and 2005, but is less than the average differences in 2008 projected revenues across Crop Reporting Districts.

The 2008 budgets were revised to take into consideration fertilizer price increases. Revised budgets are shown in the last two columns of Table 2. The only difference in costs between the "fall" budgets and the "spring" budgets is a difference in fertilizer costs due to fertilizer price increases. All fertilizer prices were increased in the spring budgets. For example, a $580 per ton anhydrous ammonia price was used in fall budgets while a $700 per ton ammonia price was used in spring budgets. Budgets prepared in the spring have non-land costs of $389 per acre for corn and $227 per acre for soybeans, giving a difference in corn and soybean costs of $162 per acre.

Table 2. Historical and 2008 Estimated Crop Returns and Costs, Central Illinois High Productivity Farmland.

	Averages for 2001-2005		2008 Budgets Prepared in Fall		2008 Budgets Prepared in Spring	
	Corn	Soybeans	Corn	Soybeans	Corn	Soybeans
Yield per acre	174	51	186	54	186	54
Price per bu	$2.22	$5.89	$3.80	$9.25	$4.90	$11.06
LDP per bu	0.166	0.27	0	0	0.00	0.00
Crop revenue	386	300	707	500	$911	$597
LDP revenue	30	14	0	0	0	0
Other government payments	35	35	27	27	27	27
Crop insurance proceeds	6	3	0	0	0	0
Gross revenue	**$457**	**$352**	**$734**	**$527**	**$938**	**$624**
Fertilizers	$63	$22	$115	$38	$140	$50
Pesticides	37	30	41	26	41	26
Seed	37	25	55	36	55	36
Drying	9	2	9	2	9	2
Storage	7	3	12	4	12	4
Crop insurance	6	4	20	8	20	8
Total direct costs	**$159**	**$86**	**$252**	**$114**	**$277**	**$126**
Machine hire/lease	$6	$5	$6	$5	$6	$5
Utilities	4	3	3	3	3	3
Machine repair	12	10	13	11	13	11
Fuel and oil	9	8	16	15	16	15
Light vehicle	1	1	2	1	2	1
Mach. depreciation	23	20	22	20	22	20
Total power costs	**$55**	**$47**	**$62**	**$55**	**$62**	**$55**
Hired labor	$8	$8	$8	$8	$8	$8
Building repair and rent	4	2	3	2	3	2
Building depreciation	5	3	4	2	4	2
Insurance	7	7	10	10	10	10
Misc.	6	6	7	7	7	7
Interest (non-land)	13	12	18	17	18	17
Total overhead costs	**$43**	**$38**	**$50**	**$46**	**$50**	**$46**
Total non-land costs	**$257**	**$171**	**$364**	**$215**	**$389**	**$227**
Operator and land return	**$200**	**$181**	**$370**	**$312**	**$549**	**$397**
Operator and land returns for[2]:						
1/2 corn -- 1/2 soybeans	$199		$353		$488	
2/3 corn -- 1/3 soybeans	$194		$351		$498	
all corn	$183		$346		$520	

[1] Averages for grain farms enrolled in Illinois Farm Business Farm Management.

[2] The corn results represent a blend of corn-after-soybeans and corn-after-corn returns. For calculating operator and farmland returns, corn-after-soybeans is assumed to yield 5 bushels more than the corn shown above while corn-after-corn is assumed to yield 5 bushels less. Corn-after-soybeans is assumed to have $5 less costs than above and corn-after-corn is assumed to have $5 more costs.

Given the revised fertilizer prices, corn costs have increased relatively more than soybean costs. The difference in 2008 corn minus soybean costs is $149 per acre given fall prices and $162 given spring prices. However, increases in costs do not cause soybeans to be more profitable than corn. The smallest difference in corn and soybean revenue across Crop Reporting Districts is $230 per acre (see Table 1). Given the smallest revenue difference, corn is projected to be more profitable than soybeans by $69 per acre ($230 revenue difference - $162 cost difference).

The $700 anhydrous price used in the spring budgets may be below what some farmers had to pay for nitrogen. Even with higher anhydrous prices, corn will be projected to be more profitable than soybeans. A $100 per ton increase in anhydrous ammonia price will increase nitrogen costs by $8.90 per acre, given that 170 pounds of actual nitrogen are applied per acre. An $8.90 increase in costs will reduce but not eliminate the returns advantage of corn.

There are a number of factors that could change these calculations:

- Relative corn and soybean price change could cause profitability to switch.
- Relative yields could vary. In particular, any yield drag for corn-after-corn could narrow profits
- Insect, disease, or fungus problems could require pesticide treatments which could raise the costs of one of the crops.

Summary

Magnitude of differences in projected revenue of corn and soybeans across Crop Reporting Districts are large, suggesting that many farms will find corn production more profitable than soybean production. While Illinois farmers may shift acres from corn to soybeans in 2008, the relative profitability of the crops do not appear to be a reason for this acreage shift.

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.

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