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Soybean Planting Decision in 2016: Are Soybeans-After-Soybeans Profitable?

Gary Schnitkey

Department of Agricultural and Consumer Economics
University of Illinois

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Recent analysis suggests that soybeans have been more profitable than corn in Illinois from 2013 to 2015, and there is a reasonable chance that soybeans will be more profitable than corn in 2016 (*farmdoc daily*, February 16, 2016). Soybeans being more profitable than corn leads to the question: Should Illinois farmers raise more soybeans and cut back on corn acres in 2016? For many Illinois farmers, raising more soybeans will require planting soybeans on farmland planted to soybeans in 2015 (soybeans-after-soybeans). In this article, soybean-after-soybean budgets are presented for four regions of Illinois. When the previous crop is soybeans, 2016 budgets using current fall delivery prices indicate soybeans will be more profitable than corn in two of the four regions. For farmland previously planted to corn, soybeans are projected to be more profitable than corn in all Illinois regions.

Illinois Crop Budgets and Soybeans-after-Soybeans

Past issues of *Illinois Crop Budgets* contain estimates for corn-after-soybeans, corn-after-corn, soybeans-after-corn, and soybeans-after-two-years-corn. These crop selections were made based on the assumption that most farmers would be planting more corn than soybeans, meaning that corn-after-corn will occur in many situations.

Now some farmers may be considering planting more soybeans. In some instances, raising more soybeans will require planting soybeans on farmland planted to soybeans in the previous year. For this decision, a soybeans-after-soybeans budget is useful. The second column of Table 1 shows a soybeans-after-soybeans budget. The soybeans-after-soybeans budget is adapted from the soybeans-after-corn budget, with the only change being a 5% reduction in yields from soybeans-after-corn. For example, soybeans-after-corn in Northern Illinois is expected to have a 60 bushel per acre yield in 2016 (see the fourth column of Panel A, Table 1). The soybeans-after-soybeans yield is 5% less at 57 bushels per acre (second column of Panel A, Table 1). Constructing the soybeans-after-soybeans budget in this way assumes that pest problems such as cyst nematode are not a problem for the fields being analyzed.

Table 1 contains four budgets. The first two are corn-after-soybeans and soybeans-after-soybeans, providing information for when last year's crop is soybeans. The last two budgets are corn-after-corn and soybeans-after-corn, which are useful for decisions when the previous crop is corn. Budgets are given for

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four different regional breakouts: Northern Illinois (Panel A), Central Illinois with high-productivity farmland (Panel B), Central Illinois with low productivity farmland (Panel C), and Southern Illinois (Panel D).

	Corn- after- Soybean	Soybeans- after- Soybeans	Corn- after- Corn	Soybean- after- Corn
Panel A. Northern Illinois				
Yield	196	57	186	60
Price	\$3.60	\$8.70	\$3.60	\$8.70
Crop revenue	706	496	670	522
ARC/PLC	30	30	30	30
Gross revenue	\$736	\$526	\$700	\$552
Non-land costs	609	354	628	354
Operator and land return	\$127	\$172	\$72	\$198
Panel B. Central Illinois -- High Productivity				
Yield	201	56	191	59
Price	\$3.60	\$8.70	\$3.60	\$8.70
Crop revenue	724	487	688	513
ARC/PLC	30	30	30	30
Gross revenue	\$754	\$517	\$718	\$543
Non-land costs	552	351	567	351
Operator and land return	\$202	\$166	\$151	\$192
Panel C. Central Illinois -- Low Productivity				
Yield	186	50	176	53
Price	\$3.60	\$8.70	\$3.60	\$8.70
Crop revenue	670	435	634	461
ARC/PLC	30	30	30	30
Gross revenue	\$700	\$465	\$664	\$491
Non-land costs	560	344	576	344
Operator and land return	\$140	\$121	\$88	\$147
Panel D. Southern Illinois				
Yield	164	46	154	48
Price	\$3.60	\$8.70	\$3.60	\$8.70
Crop revenue	590	\$400	\$554	418
ARC/PLC	25	25	25	25
Gross revenue	\$615	\$425	\$579	\$443
Non-land costs	578	353	594	353
Operator and land return	\$37	\$72	-\$15	\$90

Source: 2016 Illinois Crop Budgets, University of Illinois

Values for corn-after-soybeans, corn-after-corn, and soybeans-after-corn come from [2016 Illinois Crop Budgets](#), except for the price of corn and soybeans. In Table 1, a \$3.60 per bushel corn price, and a \$8.70 per bushel soybean price, near current fall delivery bid prices.

Soybeans-After-Soybeans and Corn-After-Soybeans Returns

For Northern Illinois, corn-after-soybeans is projected to have an operator and land return of \$127 per acre. An operator and land return equals gross revenue minus non-land costs and represents a return to both operating and owning the farmland. The \$127 return for corn compares to a \$172 return for soybeans-after-corn, meaning that soybeans are expected to be \$45 per acre more profitable than corn.

Relative profitability differs by region:

- Central Illinois – High Productivity (Panel B): Corn-after-soybeans is expected to be \$36 more profitable than soybeans-after-corn: \$202 per acre for corn-after-soybeans versus \$166 for soybeans-after-soybeans
- Central Illinois – Low Productivity (Panel C): Corn-after-soybeans is expected to be \$19 per acre more profitable soybeans-after-soybeans: \$140 per acre for corn-after-soybeans compared to \$121 per acre for soybeans-after-soybeans.
- Southern Illinois (Panel D): Soybeans-after-soybeans is expected to be \$35 per acre more profitable than corn-after-soybeans: \$37 per acre for corn-after-soybeans compared to \$72 per acre for soybeans-after-soybeans.

Slight differences in yields and costs cause profit differences across regions. Soybean yield is relatively higher than corn yield in Northern and Southern Illinois as compared to the two central Illinois regions. The ratio of soybean to corn yields is above .28 in Northern and Southern Illinois and below .28 in the central Illinois breakdowns. Corn costs are projected higher in Northern Illinois than in the other regions, causing the relative profitability of soybeans to increase relative to corn.

Soybeans-After-Corn and Corn-After-Corn Returns

In all regions, soybeans are more profitable than corn when the previous crop is corn:

- Northern Illinois: Soybeans are expected to be \$126 per acre more profitable than corn (\$72 for corn-after-corn compared to \$198 for soybeans-after-corn).
- Central Illinois with high-productivity farmland: Soybeans are expected to be \$41 per acre more profitable than corn (\$151 for corn-after-corn compared to \$192 for soybeans-after-corn).
- Central Illinois with low-productivity farmland: Soybeans are expected to be \$59 per acre more profitable than corn (\$88 for corn-after-corn compared to \$147 for soybeans-after-corn).
- Southern Illinois: Soybeans are expected to be \$105 per acre more profitable than corn (-\$15 for corn-after-corn compared to \$90 for soybeans-after-corn).

Sensitivity of Results

Changes in prices, yields, or costs could cause the relative profitability to switch between crops. For example, Table 2 shows break-even soybean yields. Take the Northern Illinois case. The break-even soybean yield is 52 bushels per acre given that the previous crop is soybeans. This value was calculated for a 196 bushel per acre corn yield with costs and prices at levels shown in Table 1. When yields are above 52 bushels per acre, soybeans will be more profitable than corn, given no changes in other factors shown in Table 1.

Region	Previous Crop	
	Soybeans	Corn
	bu/acre	bu/acre
Northern	52	46
Central-High	60	54
Central-Low	52	46
Southern	42	36

¹ Break-even levels are for budgets in Table 1. If soybeans are above these levels, soybeans will be more profitable than corn.

When the previous crop is corn, break-even soybean yields are relatively low. The break-even yields are 46 bushels per acre in Northern Illinois, 54 bushels per acre in Central Illinois with high-productivity farmland, 46 bushels per acre in Central Illinois with low productivity farmland, and 36 bushels per acre in Southern Illinois. Given these low break-even yields, it is highly likely that soybeans will be more profitable than corn in 2016 when the previous crop is corn.

Table 3 shows break-even soybean prices for the four regions when the previous crop is soybeans. These break-even yields use the yields and prices shown in the first two columns of Table 1 – the corn and soybean budgets when the previous crop is soybeans. For Northern Illinois, the break-even soybean price is \$7.91 given a \$3.60 corn price, meaning soybean will be more profitable than corn at soybeans prices above \$7.91 per bushel.

Table 3. Break-Even Soybean Prices When the Previous Crop is Soybeans¹

Corn Price	North	Central-High	Central-Low	South
\$ per bushel				
3.00	5.84	7.31	6.84	5.80
3.20	6.53	8.04	7.58	6.52
3.40	7.22	8.77	8.33	7.23
3.60	7.91	9.50	9.07	7.94
3.80	8.59	10.23	9.82	8.66
4.00	9.28	10.96	10.56	9.37
4.20	9.97	11.69	11.30	10.08
4.40	10.66	12.43	12.05	10.80
4.60	11.34	13.16	12.79	11.51
4.80	12.03	13.89	13.54	12.22
5.00	12.72	14.62	14.28	12.93

¹ If the actual soybean price is above the break-even, soybeans will be more profitable than corn. In northern Illinois at a \$3.60 corn price, soybeans will be more profitable than at prices above \$7.91.

A \$3.60 corn price is near the current level of fall bids. Both corn and soybean prices could be higher at harvest. Suppose corn prices increase to \$4.20 corn price. In this case, the break-even soybean price is \$9.97 per bushel (see Table 3). Note that the break-even soybean price rose more than the increase in the corn price. A move in corn prices from \$3.60 to \$4.20 is a 17% increase. Break-even soybean rose from \$7.91 per bushel to \$9.97 per bushel a 26% increase. The 26% increase in break-even soybean price is 10 percentage points higher than the 17% increase in corn price. Break-even soybean prices increase more than corn not only in Northern Illinois but across all Illinois regions. For a 17% corn price increase from \$3.60 to \$4.20, break-even soybean prices increase 22% in Central Illinois with high-productivity, 25% for Central Illinois with low productivity, and 27% for Southern Illinois.

Because break-even soybean prices rise proportionally more than corn prices, an increasing price environment could shift the profitability more to corn unless soybeans prices rise proportionately more than corn prices. Higher commodity prices tend to make corn more profitable relative to soybeans.

Summary

Budgets using current prices suggest that soybeans will be more profitable than corn on farmland that was in corn last year. When the previous crop is soybeans, soybean may be more profitable than corn; however, relative yields and costs play a key role in relative profitability.

Whether farmers should switch to more soybeans in their rotations is an open question. Relative profitability projections early in the year often are in error as growing and demand conditions will differ from expectations. Some research suggests stable rotations provide as good as returns as varying rotations based on pricing conditions.

Perhaps the most striking item in the budgets is the continuing low projections of operator and land returns. At this point, positive net incomes on grain farms are not likely for 2016, particularly if a large amount of farmland is cash rented.

References

Schnitkey, G. "[Corn versus Soybean Returns: 2016 Projections with Historical Comparisons.](#)" *farmdoc daily* (6):30, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, February 16, 2016.

Schnitkey, G. "[Crop Budgets, Illinois, 2016.](#)" Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, December, 2015.