

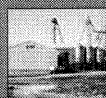


Improving farm decision-making under risk through education and research.



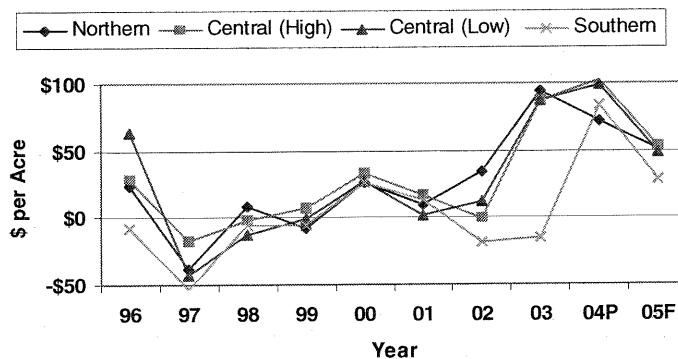
More Corn and Fewer Soybeans: Does it Pay?

Gary Schnitkey
and Dale Lattz



In recent years, corn has become more profitable than soybeans:

Corn Returns Minus Soybean Returns by Illinois Region, Illinois FBFM, 1996 - 2005.





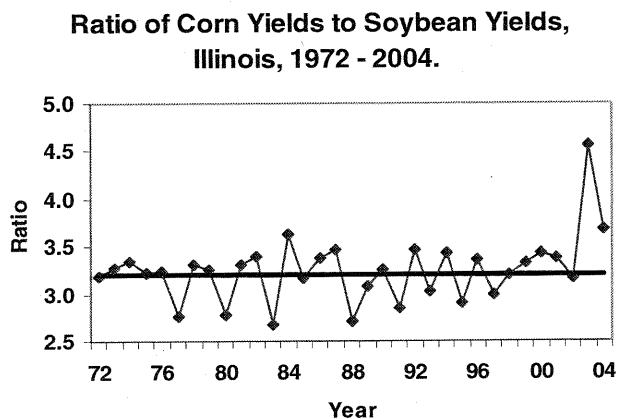
Examine following factors that contribute to corn return increase:

- Yield changes
- Price changes
- Loan rate changes
- Cost changes
- Soybean rust

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Except for 2002, corn yields have been above average in the last several years:



Favors corn, will it continue?

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National Loan Rates

	Corn	Soybeans
Pre 2002 Farm Bill	\$1.89	\$5.26
2002 Farm Bill (2004 - 2007 rate)	\$1.95	\$5.00

Favors corn production

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**Corn variable costs have increased faster than
soybeans. Favors soybeans**

Per Acre Variable Costs Northern Illinois

Year	Corn	Soybeans
2000	\$166	\$102
2001	174	106
2002	169	107
2003	180	110
2004P	189	112
2005F	195	116

Source: Illinois FBFM

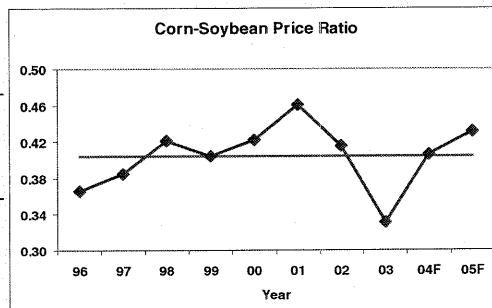
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Prices Farmers Received, Central Illinois

Year	Corn Price	Bean Price	Corn-Bean Ratio
1996	\$2.76	\$7.54	0.37
1997	2.49	6.48	0.38
1998	2.09	4.96	0.42
1999	1.95	4.82	0.40
2000	1.97	4.67	0.42
2001	2.08	4.52	0.46
2002	2.35	5.65	0.42
2003	2.40	7.25	0.33
2004P	2.05	5.05	0.41
2005F	2.20	5.10	0.43

Source: Illinois FBFM



No trend

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Soybean Rust

Favors corn, impacts not well defined:

- Will not impact production every year
- Likely to have high fungicide costs (\$15 - \$30 per acre)
- Potential yield reduction

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Most important factors impacting corn profits

- **High corn yields relative to soybean yields. Will this continue?**
- **Soybean rust?**

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Evaluating a Switch to More Corn Assumptions

- **Start with 50% corn – 50% soybean rotation**
- **Prepare corn-after-soybean, corn-after-corn, and soybean budgets**

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Evaluating a Switch to More Corn Assumptions

- **Corn-after-soybeans, soybean budgets**
 - Yields based on five-year average yields
 - Costs adjusted to 2005 conditions
 - Enterprise costs in management section of *farmdoc*
- **Corn-after-corn budgets**
 - 10% yield reduction
 - \$10 per acre higher costs (nitrogen)

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Steps

1. **Short-run. Look at budgets. Only tells you what happens in first year**
2. **Long-run. Look at returns from rotations. Usually more difficult for adding corn to be more profitable in the long-run**

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Example

Corn-after-soybean return = \$190 per acre

Corn-after-corn return = \$145 per acre

Soybean return = \$110 per acre

Short-run:

Corn has higher returns

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Long-run (After 1st year)

1/2 corn – 1/2 soybeans

2/3 corn – 1/3 soybeans

1/2 corn-after-beans return (\$190)
1/2 soybean return (\$110)

1/3 corn-after-bean return (\$190)
1/3 corn-after-corn return (\$145)
1/3 soybean return (\$110)

Replace corn-after-beans with corn-after-corn return

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Long-Run Returns

$$\begin{aligned} 1/2 \text{ corn} - 1/2 \text{ soybeans} &= \$150 \\ &= \$190 \text{ corn-after-beans} \times 1/2 + \\ &\quad \$110 \text{ soybeans} \times 1/2 \end{aligned}$$

$$\begin{aligned} 2/3 \text{ corn} - 1/3 \text{ soybeans} &= \$148 \\ &= \$190 \text{ corn-after-beans} \times 1/3 + \\ &\quad \$145 \text{ corn-after-corn} \times 1/3 + \\ &\quad \$110 \text{ soybeans} \times 1/3 \end{aligned}$$

Short-run favors
more corn

Long-run favors
1/2 - 1/2 rotation

Typical this year

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Northern Illinois Budgets

	Corn- After- Soybeans	Corn- After- Corn	Soybeans
Yield	166	149	46
Price	\$2.20	\$2.20	\$5.10
Revenue	\$365	\$328	\$235
Variable Costs	\$195	\$205	\$116
Return	\$170	\$123	\$119

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Northern Illinois

Short-run. Planting more corn will be more profitable because substituting corn-after-corn (\$123 return) for soybeans (\$119)

Long-run. After first year, raising more corn is not profitable

1/2 corn – 1/2 soybeans = \$145

2/3 corn – 1/3 soybeans return = \$137

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Northern Illinois Sensitivity Analysis *

% Corn-After-Corn Yield Loss	Soybean Cost Increase (per acre)
0%	-\$31
5%	\$3
10%	\$43
15%	\$79

* Soybean cost increase for more corn than in 1/2 corn – 1/2 soybean rotation to be profitable (long-run)

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Central Illinois (High) Budgets

	Corn- After- Soybeans	Corn- After- Corn	Soybeans
Yield	173	156	49
Price	\$2.25	\$2.25	\$5.20
Revenue	\$389	\$351	\$255
Variable Costs	\$192	\$202	\$111
Return	\$197	\$149	\$144

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Central Illinois (High Productivity Farmland)

Short-run. In first year, planting more corn will be more profitable because substituting corn-after-corn (\$149 return) for soybeans (\$144)

Long-run. After first year, raising more corn is not profitable

$$1/2 \text{ corn} - 1/2 \text{ soybeans} = \$171$$

$$2/3 \text{ corn} - 1/3 \text{ soybeans return} = \$163$$

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Central Illinois (High) Sensitivity Analysis *

% Corn-After- Corn Yield Loss	Soybean Cost Increase (per acre)
0%	-\$33
5%	\$7
10%	\$43
15%	\$83

* Soybean cost increase for more corn than in $\frac{1}{2}$ corn –
 $\frac{1}{2}$ soybean rotation to be profitable (i.e., long-run)

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Central Illinois (Low) Budgets

	Corn- After- Soybeans	Corn- After- Corn	Soybeans
Yield	165	149	46
Price	\$2.25	\$2.25	\$5.20
Revenue	\$371	\$335	\$239
Variable Costs	\$193	\$203	\$112
Return	\$178	\$132	\$127

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Central Illinois (Low Productivity Farmland)

Short-run. Planting more corn will be profitable,
corn-after-corn (\$132 return) for soybeans
(\$127)

Long-run. After first-year, raising more corn is
not profitable

1/2 corn – 1/2 soybeans = \$153

2/3 corn – 1/3 soybeans return = \$146

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Central Illinois (Low) Sensitivity Analysis *

% Corn-After- Corn Yield Loss	Soybean Cost Increase (per acre)
0%	-\$31
5%	\$5
10%	\$41
15%	\$81

* Soybean cost increase for more corn than in 1/2 corn –
1/2 soybean rotation to be profitable (i.e., long-run)

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Southern Illinois Budgets

	Corn- After- Beans	Corn- After- Corn	Beans	Wheat	Double- Crop Beans
Yield	139	125	42	55	20
Price	\$2.30	\$2.30	\$5.30	\$3.10	\$5.30
Revenue	320	288	223	171	106
Variable Costs	182	192	114	79	55
Return	138	96	109	92	51

1/2 corn - 1/2 soybeans = \$124 per acre

1/3 corn - 1/3 soybean - 1/3 wheat = \$113 per acre

1/3 corn - 1/3 soybean - 1/3 wheat (double bean) = \$130 per acre ²⁵



Southern Illinois

Short-run. Adding more corn does not increase returns

Long-run. Adding more corn does not increase returns



Southern Illinois Sensitivity Analysis *

% Corn-After- Corn Yield Loss	Soybean Cost Increase (per acre)
0%	-\$9
5%	\$23
10%	\$55
15%	\$89

* Soybean cost increase for more corn than in $\frac{1}{2}$ corn –
 $\frac{1}{2}$ soybean rotation to be profitable (i.e., long-run)

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Other Considerations

Items to consider even if corn is more profitable:

- Risk
- Machinery costs
- Prices may adjust
- Time demands
- Increased pests

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Summary

- **Some farmers may find planting more corn to be profitable:**
 - Yields above 160 bu corn, 45 soybean
 - Corn-bean ratios greater than 3.4
 - Not a large yield loss on corn-after-corn
- **Suggest:**
 - Calculating historical yield ratios
 - Performing enterprise analysis

