

December 5, 2005**FEFO 05-22****Projected Returns for Corn and Soybean in 2006**

Illinois farmers have planted more corn acres and fewer soybean acres in recent years. The trend of increasing corn acres may stop in 2006 because projected corn costs have increased more than projected soybean costs. Budgets indicate that corn-after-corn (i.e., raising corn on farmland that was planted to corn in the previous year) may be less profitable than soybeans. From a returns perspective, farmers may wish to plant soybeans on farmland that could be corn-after-corn in 2006. Planting more soybeans, however, may increase risks as soybean rust is a possibility.

Switch to corn acres

Between 1997 and 2005, total corn and soybean acres in Illinois have been relatively stable, with a low of 21 million acres in 1997 and a high of 21.6 million acres in 2005. Total acres devoted to corn and soybeans represent over 90% of the planted acres in Illinois. Hence, corn acre increases generally cause soybean acre decreases and vice versa.

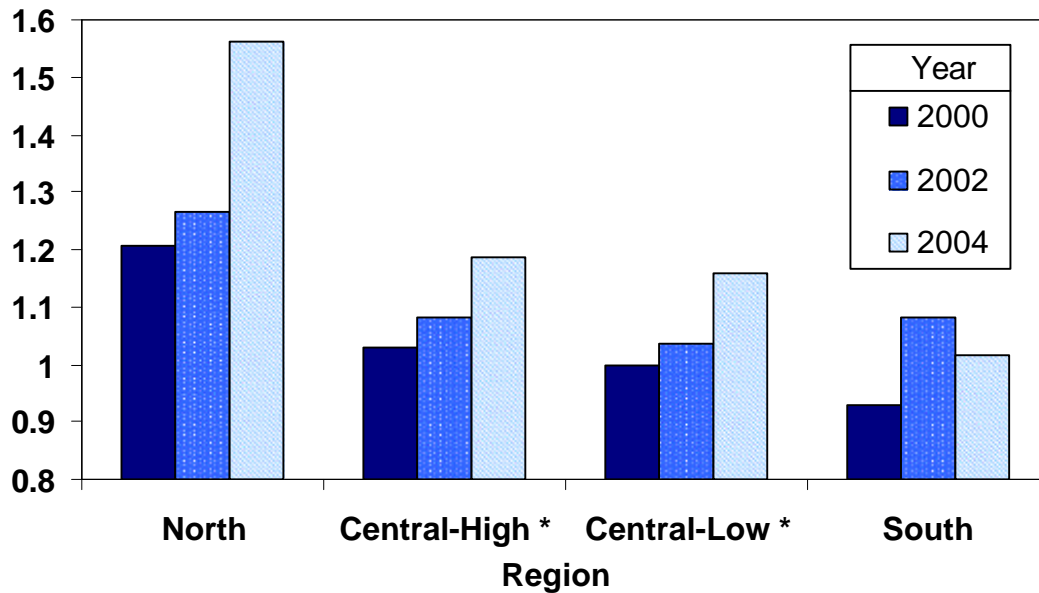
Since 1998, corn acres have increased in Illinois. In 1998, the ratio of corn-to-soybean acres was 1.00, meaning that there was one acre of corn for every acre of soybeans. The corn-to-soybean acre ratio was 1.03 in 2002, 1.07 in 2003, 1.17 in 2004, and 1.27 in 2005. Given constant total corn and soybean acres in Illinois, a 1.27 ratio means that for every corn acre that followed soybeans, there was .27 acres of corn-after-corn.

The distribution of corn-to-soybean acres varies across Illinois, with the northern part having more acres of corn relative to soybeans (see Figure 1). For grain farms enrolled in Farm Business Farm Management (FBFM), the corn-to-soybean acre ratio for northern Illinois farms was 1.56 in 2004. In central Illinois, the ratio was much lower with a 1.18 ratio for farms having high-productivity farmland and a 1.16 ratio for farms with low-productivity farmland. Southern Illinois farms had the lowest ratio of 1.01.

Reasons for the shift

Two factors can explain the shift to more corn acres from 1998 to 2005. First, corn has been more profitable than soybeans. To examine profitability, revenue less non-land costs were calculated using Farm Business Farm Management (FBFM) data for grain farms in northern, central, and southern Illinois. Central Illinois farms were divided into two categories: farms with high-productivity farmland and farms with low-productivity farmland.

Figure 1. Corn Acres Divided by Soybean Acres on Illinois BBFM Grain Farms, 2000, 2002, and 2004.



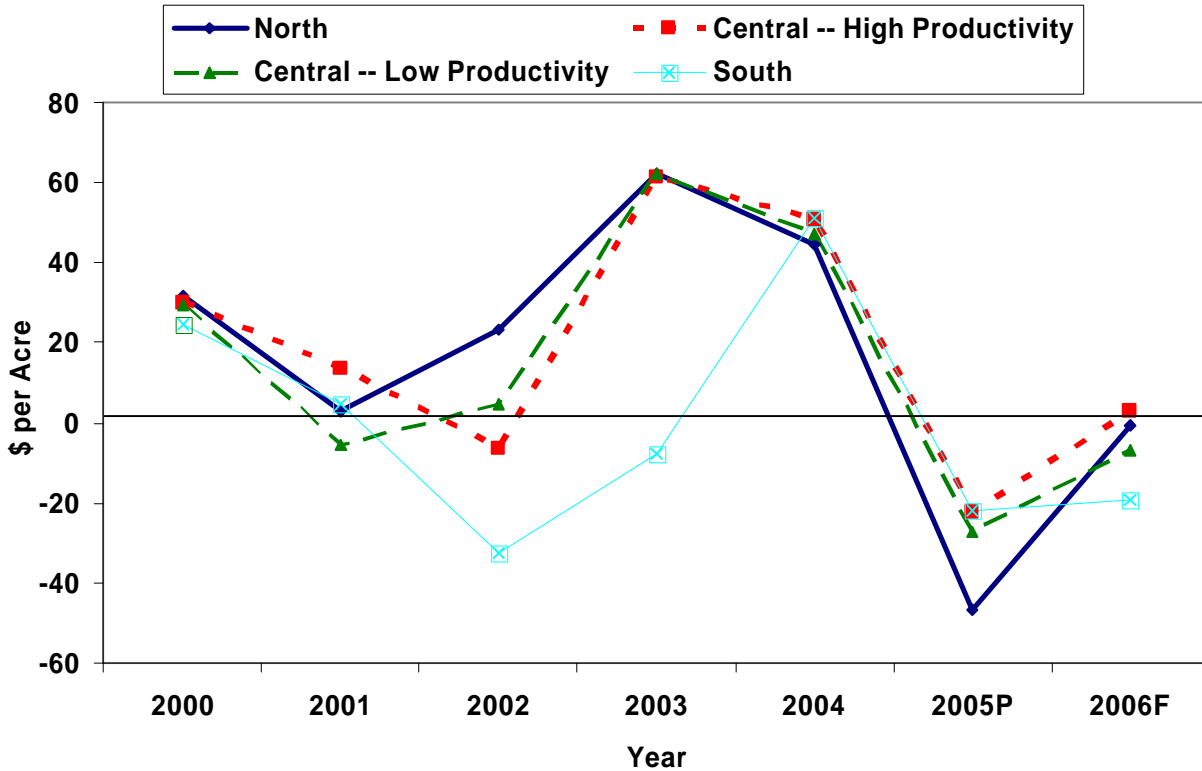
* The central region is divided into farms with high-productivity farmland and farms with low-productivity farmland.

In northern Illinois, corn returns exceeded soybean returns each year from 2000 through 2004 (see Figure 2). In 2000, the difference was \$32 per acre, indicating that corn return was \$32 higher than soybean return. Corn and soybean returns were almost equal in 2001, as indicated by a corn minus soybean return difference of \$3 per acre. Differences became quite large in 2002 through 2004: \$23 per acre in 2002, \$62 per acre in 2003, and \$44 per acre in 2004. Similar trends exist for central Illinois (see Figure 2). In southern Illinois, corn returns have not exceeded soybean returns as much as in the other regions. The difference was \$25 in 2000, \$5 in 2001, -\$33 in 2002, -\$8 in 2003, and \$51 in 2004.

The pattern exhibited by return differences across regions correlates with differences in corn-to-soybean acre ratios across regions. From 2000 to 2004, the average returns difference was \$33 for northern Illinois, \$30 for central Illinois with high productivity farmland, \$28 for central Illinois with low-productivity farmland, and \$8 for southern Illinois. Corn-to-soybean acre ratios exhibit the same ordering: northern Illinois (1.56 corn-to-soybean acre ratio in 2004), central Illinois farms with high-productivity farmland (1.18), central Illinois with low-productivity farmland (1.16), and southern Illinois (1.01). This correlation suggests that profitability differences may partially explain corn-to-soybean acre ratio differences across regions.

The second factor likely causing a shift to more corn is an increase in the perceived risk of soybean production. Up to 2003, soybeans were often viewed as the “safe” crop as soybean yields did not exhibit as much variability as corn yields. In 2003, that perception began to change as soybean yields were considerably below trend-line yields on many farms. Low 2003

Figure 2. Corn Returns Minus Soybean Returns, Regions of Illinois



yields were followed in the next year by the discovery of soybean rust in southern United States, increasing the probability that rust could occur in Illinois.

Cost increases

Recent cost increases have reduced corn returns more than soybean returns. On Illinois grain farms, variable costs for corn are projected to be \$55 per acre higher in 2006 than in 2002. Variable costs for soybeans are projected to be \$20 per acre higher in 2006 than in 2002 (see “Variable Cost Increases for Corn and Soybeans in Historical Perspective”, *Illinois Farm Economics: Facts and Opinions*, September 30, 2005 on *farmdoc*).

Profitability changes can be seen in Figure 2 by examining the forecasted differences in corn returns and soybean returns in 2005 and 2006. The preliminary returns difference in northern Illinois for 2005 is -\$47 per acre, meaning that corn returns are \$47 per acre less than soybean returns. Similarly, the return difference is -\$22 for central Illinois (high-productivity farmland), -\$27 for central Illinois (low-productivity farmland), and -\$22 for southern Illinois. Return differences are negative in 2005 not only because of cost increases but also because dry weather reduced corn yields more than soybean yields. Forecast 2006 returns differences are projected to be -\$1 per acre for northern Illinois, \$3 for central Illinois with high-productivity farmland, -\$7 for central Illinois with low-productivity farmland, and -\$19 for southern Illinois. These differences are projected using trend-line yields and commodity prices based on futures prices during early December 2005.

Return differences shown in Figure 2 have a corn return representing an average of corn-after-soybean and corn-after-corn production. Corn-after-soybeans and corn-after-corn can have different returns because of yield and cost differences. Table 1 shows corn-after-soybean, corn-after-corn, and soybean budgets for northern Illinois (similar budgets for other Illinois regions are shown at the end of this article). Budgets show all revenue from crop sales and government commodity program payments. Categories for expenses include direct, power, and overhead categories. Summing costs gives “total non-land costs”. Revenue less non-land cost gives operator and land return, representing funds to pay land costs and to provide the operator a return.

Corn-after-soybeans has a \$116 projected operator and land return, soybeans has a \$99 return, and corn-after-corn has a \$75 return. These results indicate that corn-after-corn may not be as profitable as soybeans. Hence, some farmers may wish to shift corn-after-corn acres to soybeans.

Yield drag on corn-after-corn

Perhaps the most controversial item in the budgets shown in Table 1 is the yield drag associated with corn-after-corn. In these budgets, corn-after-soybeans has a 169 bu yield compared to a 157 bu yield for corn-after-corn. Agronomic research consistently shows that corn-after-corn yields average about 10% lower than corn-after-soybean yields. Many farmers, however, doubt that a yield drag exists.

The disparity between farmer experience and agronomic research in some cases may be due to how comparisons are made. Many farmers plant corn-after-corn on their highest yielding farmland. Because this farmland is higher yielding, corn-after-corn yields may be higher than the corn-after-soybean yields grown on less productive farmland. Most agronomic research is done with the two crop sequences in the same field, and so does not pick up differences in soil productivity. Such research suggests that yields productivity farmland where corn-after-corn production occurs would be higher had corn-after-soybean production occurred instead. (This explanation was suggested by Emerson Nafziger, crop scientist in the Department of Crop Science, University of Illinois.)

In any case, budgeting exercises should be conducted given projected cost increases. Given that the cost increases having been higher for corn, corn yields are going to have to be higher in 2006 for corn returns to exceed soybean returns.

Soybean risks

Planting more soybeans, however, may increase risks. Even though an outbreak did not occur in 2005, there is a potential for soybean rust in 2006. Many models of rust incidence suggest that outbreaks will not occur every year in Illinois. Hence, the fact that an outbreak did not occur in 2005 does not provide a great deal of evidence concerning the probability of an outbreak.

Summary

Between 2000 through 2004, corn returns exceeded soybean returns in many areas of Illinois. Budgets suggest that recent cost increases have narrowed the gap between corn and soybean returns. Higher corn yields will be required in 2006 as compared to recent years for projected

corn returns to exceed soybean returns. In 2006, corn-after-corn production may be less profitable than soybean production. Hence, the trend of increasing corn acres may not continue into 2006.

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.

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

Table 1. 2006 Crop Budgets, Northern Illinois

	Corn- after- Soybeans	Corn- after- Corn	Soybeans	Wheat
Yield per acre	169	157	47	70
Price per bu	\$2.25	\$2.25	\$5.80	\$3.20
LDP per bu	0.00	0.00	0.00	0.00
Crop revenue	\$380	\$353	\$273	\$224
LDP revenue	0	0	0	0
Other gov't payments	29	29	29	29
Crop insurance proceeds	0	0	0	0
Gross revenue	\$409	\$382	\$302	\$253
Fertilizers	\$70	\$84	\$23	\$49
Pesticides	41	41	29	0
Seed	41	41	31	16
Drying	12	12	6	3
Storage	4	4	3	3
Crop insurance	8	8	6	3
Total direct costs	\$176	\$190	\$98	\$74
Machine hire/lease	\$12	\$12	\$10	\$10
Utilities	5	5	4	4
Machine repair	19	19	16	16
Fuel and oil	16	16	14	14
Light vehicle	2	2	2	2
Mach. depreciation	21	21	18	18
Total power costs	\$75	\$75	\$64	\$64
Hired labor	\$8	\$8	\$8	\$8
Building repair and rent	4	4	4	4
Building depreciation	4	4	4	4
Insurance	6	6	6	6
Misc	6	6	6	6
Interest (nonland)	14	14	13	13
Total overhead costs	\$42	\$42	\$41	\$41
Total non-land costs	\$293	\$307	\$203	\$179
Operator and land return	\$116	\$75	\$99	\$74

Table 2. 2006 Crop Budgets, Central Illinois, High-Productivity Farmland

	Corn- after- Soybeans	Corn- after- Corn	Soybeans	Wheat
Yield per acre	180	168	51	70
Price per bu	\$2.25	\$2.25	\$5.80	\$3.20
LDP per bu	0.00	0.00	0.00	0.00
Crop revenue	\$405	\$378	\$296	\$224
LDP revenue	0	0	0	0
Other gov't payments	27	27	27	27
Crop insurance proceeds	0	0	0	0
Gross revenue	\$432	\$405	\$323	\$251
Fertilizers	\$72	\$86	\$24	\$49
Pesticides	39	39	28	0
Seed	40	40	30	16
Drying	9	9	2	3
Storage	6	6	3	3
Crop insurance	8	8	6	3
Total direct costs	\$174	\$188	\$93	\$74
Machine hire/lease	\$8	\$8	\$7	\$7
Utilities	4	4	4	4
Machine repair	16	16	14	14
Fuel and oil	14	14	13	13
Light vehicle	2	2	2	2
Mach. depreciation	21	21	19	19
Total power costs	\$65	\$65	\$59	\$59
Hired labor	\$8	\$8	\$8	\$8
Building repair and rent	3	3	3	3
Building depreciation	3	3	3	3
Insurance	6	6	6	6
Misc	6	6	6	6
Interest (nonland)	13	13	12	12
Total overhead costs	\$39	\$39	\$38	\$38
Total non-land costs	\$278	\$292	\$190	\$171
Operator and land return	\$154	\$113	\$133	\$80

Table 3. 2006 Crop Budgets, Central Illinois, Low-Productivity Farmland

	Corn- after- Soybeans	Corn- after- Corn	Soybeans	Wheat
Yield per acre	168	155	48	60
Price per bu	\$2.25	\$2.25	\$5.80	\$3.20
LDP per bu	0.00	0.00	0.00	0.00
Crop revenue	\$378	\$349	\$278	\$192
LDP revenue	0	0	0	0
Other gov't payments	25	25	25	25
Crop insurance proceeds	0	0	0	0
Gross revenue	\$403	\$374	\$303	\$217
Fertilizers	\$68	\$82	\$24	\$40
Pesticides	39	39	28	0
Seed	40	40	30	16
Drying	9	9	2	3
Storage	5	5	2	3
Crop insurance	8	8	6	3
Total direct costs	\$169	\$183	\$92	\$65
Machine hire/lease	\$8	\$8	\$7	\$7
Utilities	5	5	4	4
Machine repair	17	17	14	14
Fuel and oil	14	14	12	12
Light vehicle	2	2	2	2
Mach. depreciation	21	21	19	19
Total power costs	\$67	\$67	\$58	\$58
Hired labor	\$9	\$9	\$9	\$9
Building repair and rent	4	4	4	4
Building depreciation	3	3	3	3
Insurance	7	7	7	7
Misc	6	6	6	6
Interest (nonland)	12	12	11	11
Total overhead costs	\$41	\$41	\$40	\$40
Total non-land costs	\$277	\$291	\$190	\$163
Operator and land return	\$126	\$83	\$113	\$54

Table 4. 2006 Crop Budgets, Southern Illinois

	Corn- after- Soybeans	Corn- after- Corn	Soybeans	Wheat
Yield per acre	141	129	43	58
Price per bu	\$2.25	\$2.25	\$5.80	\$3.20
LDP per bu	0.00	0.00	0.00	0.00
Crop revenue	\$317	\$290	\$249	\$186
LDP revenue	0	0	0	0
Other gov't payments	19	19	19	19
Crop insurance proceeds	0	0	0	0
Gross revenue	\$336	\$309	\$268	\$205
Fertilizers	\$80	\$70	\$24	\$35
Pesticides	32	32	29	0
Seed	43	43	30	16
Drying	4	4	6	3
Storage	2	2	1	3
Crop insurance	8	8	6	3
Total direct costs	\$169	\$159	\$96	\$60
Machine hire/lease	\$8	\$8	\$7	\$7
Utilities	4	4	4	4
Machine repair	19	19	18	18
Fuel and oil	15	15	14	14
Light vehicle	1	1	1	1
Mach. depreciation	22	22	18	18
Total power costs	\$69	\$69	\$62	\$62
Hired labor	\$11	\$11	\$11	\$11
Building repair and rent	3	3	3	3
Building depreciation	3	3	3	3
Insurance	5	5	5	5
Misc	5	5	5	5
Interest (nonland)	13	13	12	12
Total overhead costs	\$40	\$40	\$39	\$39
Total non-land costs	\$278	\$268	\$197	\$161
Operator and land return	\$58	\$41	\$71	\$44