

Costs to Produce Corn and Soybeans in Illinois—2017

Brandy M. Krapf, Dwight Raab, and Bradley L. Zwilling
Illinois FBFM Association and
Department of Agricultural and Consumer Economics
University of Illinois
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In 2017, the total of all economic costs per acre for growing corn in Illinois averaged \$876 in the northern section, \$868 in the central section for farmland with “high” soil ratings, \$845 in the central section for farmland with “low” soil ratings, and \$806 in the southern section. Soybean costs per acre were \$636, \$655, \$609 and \$616, respectively (see Table 1). Costs were lower in southern Illinois primarily because of lower land costs. The total of all economic costs per bushel in the different sections of the state ranged from \$3.82 to \$4.77 for corn and from \$9.63 to \$11.41 for soybeans. Variations in this cost were related to weather, yields, and land quality.

These figures were obtained from farm business records kept by farmers enrolled in the Illinois Farm Business Farm Management Association. The samples included only farms with more than 500 acres of productive and nearly level soils in each area of the state; these are farms without livestock. Farms located in the 22 counties north and northwest of the Illinois River are included in the sample for northern Illinois. Farms from 36 counties below a line from about Mattoon to Alton are in the sample for southern Illinois. The remaining 44 counties make up the sample for central Illinois. The sample farms averaged 1,432 tillable acres in northern Illinois, 1,399 acres in the central section with high soil ratings, 1,381 acres in the central section with lower soil ratings, and

1,640 acres in southern Illinois. This economic analysis includes some factors in the cost of doing business that nonagricultural businesses may not include. These factors are not used as expense items on income tax returns. Examples include the charge for labor performed by the farm operator, a rental charge for the use of owned and rented land, and an interest charge on equity in machinery and inventories of grain and livestock. In the short run, farm operators may continue to produce without covering these total economic costs of production. However, if returns do not equal the total economic cost of production, in the long run, it will be difficult to maintain the same level of resources in the farm firm. Also, producers will be challenged to lower their cost of production or increase volume as profit margins remain narrow.

Nonland Costs

Soil fertility costs for soybeans were allocated on the basis of phosphorus, potassium, and lime removal, with the residual cost allocated to corn. The costs of fuel, machine hire and machinery repair were reduced for income received from custom work. Labor costs included the cash value of hired labor, plus a charge for available unpaid labor at a rate of \$3,950 per month. This rate represents a charge for only the physical labor input, not including a charge for management. Building and

storage costs were for repairs and depreciation only. The nonland interest rate in 2017 was set at 4.5 percent. This figure was then multiplied by the sum of half the average inventory value of crops at the beginning and the end of the year, the economic depreciated value of machinery and buildings, and half the total operating expenses. The result is the total nonland interest charge. Overhead costs included insurance, utilities, the farm share of light vehicle expenses, and miscellaneous items. As mentioned above, no charge has been made in this analysis for management, but it may normally be about 6 percent of the total cost per bushel or 24 cents for corn and 61 cents per bushel for soybeans.

Land Costs

Land costs were the weighted average of owned, crop share and cash rent costs. Owned land costs include real estate taxes and an interest charge on owned land. For 2017, the land interest charge was 1.95 percent. The land cost for crop shared acres is the labor and equipment charges needed to produce a crop on non-revenue acres (acres the operator does not receive production from). Cash rent costs are the amounts paid to cash rent landlords. Caution is needed in interpreting differences in land costs between areas.

Cost Per Bushel and Acre

Costs **per bushel** of corn in 2017 as compared to 2016 were slightly higher in northern and central Illinois with the higher rated soils but lower in the other geographic areas of the state. Costs per bushel were higher in some areas due to higher overhead costs as well as lower yields. Costs per bushel were lower in other areas due to lower fertility and higher yields. Costs per bushel were 3 cents higher in northern Illinois, 1 cents higher in central Illinois with the higher rated soils, 5 cents lower in central Illinois with the lower rated soils and 14 cents lower in southern Illinois.

The average corn yield in 2017 was 4 bushels per acre lower than 2016 in northern Illinois, 1 bushel lower to 2 bushels higher in central Illinois and 6 bushels higher than 2016 in southern Illinois. The 2017 average corn yield in the different geographical locations ranged from 3 bushels lower to 16 bushels per acre higher than the five-year average from 2013 to 2017.

Costs **per acre** were mostly unchanged in all the different geographic regions in Illinois compared to 2016. Across the state, total costs per acre to produce corn varied from a 1 percent decrease to a 1 percent increase. Fertility and land costs decreased while drying, and nonland interest costs increased.

Production costs **per bushel** of soybeans in 2017 increased in all areas of the as compared to 2016. Costs per bushel increased due to higher pesticide costs and lower yields. Soybean yields were lower when compared to the year before. Soybean yields ranged from 1 to 7 bushels per acre lower in 2017 compared to 2016. Changes in costs per bushel ranged from 18 cents higher in central Illinois with higher rated soils to \$1.11 higher in northern Illinois.

Total costs **per acre** decreased in northern and central Illinois with lower rated soils while total costs increased in the other geographic regions of the state when compared to 2016. Costs decreased \$2 per acre in northern Illinois and in central Illinois with the lower rated soils while costs increased \$4 per acre in central Illinois with the higher rated soils and \$13 per acre in southern Illinois. Average soybean yields in the different areas ranged from 2 bushels lower to 3 bushels per acre higher than the five-year average from 2013 to 2017.

State Averages

Total costs to produce corn for all combined areas of the state were \$856 per acre. This figure was similar to the year before.

Variable costs decreased \$6 per acre or 1 percent, other nonland costs increased \$8 per acre, and land costs decreased \$5 per acre. In 2017, cash costs accounted for 46 percent of the total cost of production for corn, other nonland costs were 29 percent, and land costs were 25 percent. The average corn yield for all combined areas of the state was 216 bushels per acre resulting in a total cost of production of \$3.96 per bushel. The average corn yield was the highest on record. Total costs per acre were the lowest in the last six years while total costs per bushel were the lowest in the last nine years.

Total cost per acre to produce soybeans increased, from \$633 per acre in 2016 to \$637 per acre in 2017. Pesticides, nonland interest, and overhead costs accounted for most of the increase. Variable costs accounted for 32 percent of the total cost of production for soybeans, other nonland costs 34 percent and land costs 33 percent. The average soybean yield for all combined areas of the state was 62 bushels per acre resulting in a total cost of production of \$10.27 per bushel. The average soybean yield was the second highest on record. The cost per bushel to raise soybeans the last five years averaged \$10.68 per bushel.

Cost Comparison

Average variable costs per bushel of corn for the five-year period 2013 through 2017 ranged from \$1.99 in central Illinois with the higher rated soils to \$2.46 in southern Illinois. Total costs per bushel ranged from \$4.19 in central Illinois with the higher rated soils to \$4.92 in southern Illinois. Total costs per bushel were higher in southern Illinois due to lower yields.

Average variable costs per bushel of soybeans ranged from \$3.45 in northern Illinois to \$4.32 in southern Illinois. Total costs per bushel varied from \$10.37 in central Illinois with the higher rated soils to \$11.81 in southern Illinois. Like for corn, soybeans total cost per bushel were higher in southern Illinois due to lower yields.

2018 Forecast

Forecasts for Illinois production costs in 2018 look to be less using Gary Schnitkey's 2018 crop budgets and the USDA's Cost-of-Production Forecasts as a guide. For corn, 2018 variable costs are projected to decrease 2 percent, mainly due to soil fertility costs. For 2018, soybeans have a larger projected decrease of variable costs of 4 percent. This decrease is also primarily due to soil fertility costs. With tightening margins, these decreases are needed. However, additional cutting of overhead and land costs will need to occur to make returns more profitable in 2018.

Acknowledgment

The author would like to acknowledge that 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 5,500 plus farmers and 60 plus professional field staff, is a not-for-profit organization available to all farm operators in Illinois. FBFM field staff provide 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.

Figure 1. Total Costs Per Acre To Grow Corn On Illinois Grain Farms

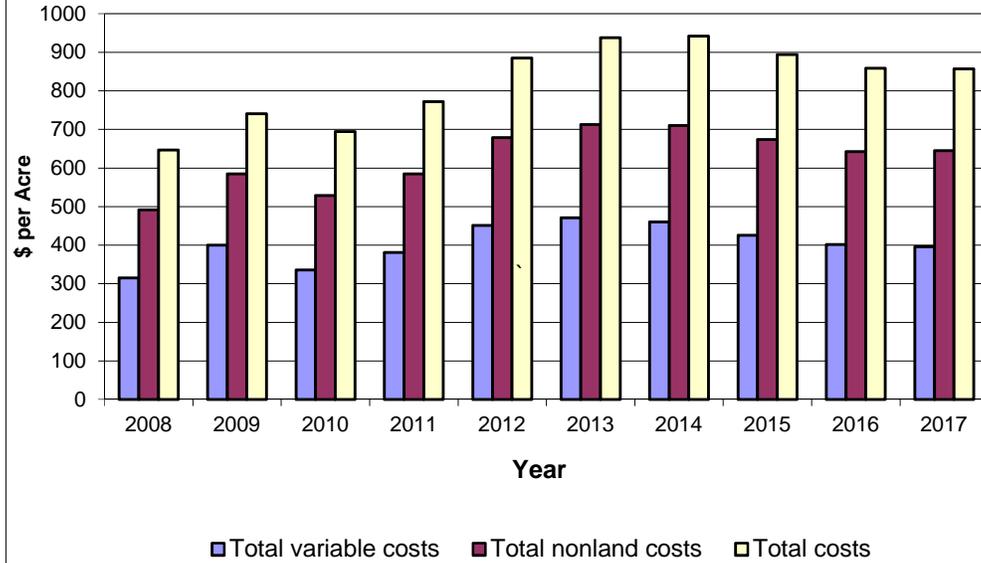


Figure 2. Total Costs Per Acre To Grow Soybeans On Illinois Grain Farms

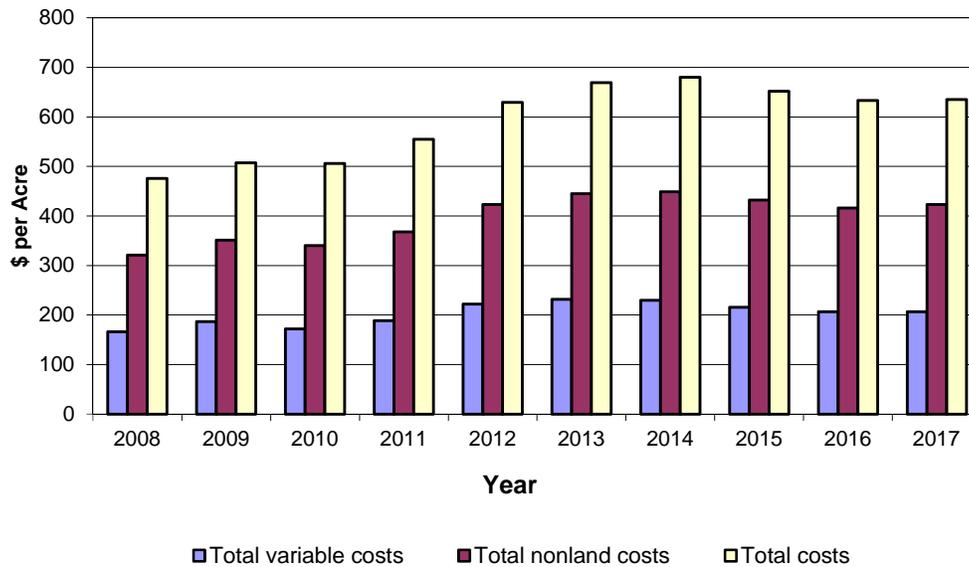


Table 1. Cost Per Acre for Growing Corn and Soybeans on Illinois Grain Farms Without Livestock in 2017

	Corn				Soybeans			
	Northern	Central ¹ High	Central ² Low	Southern	Northern	Central ¹ High	Central ² Low	Southern
Number of Farms	346	588	326	187	346	588	326	187
Acres in crop	859	710	692	701	536	673	658	816
NONLAND COSTS								
Variable Costs:								
Soil Fertility	\$124	\$135	\$136	\$124	\$31	\$44	\$38	\$40
Pesticides	58	73	74	77	35	44	46	54
Seed	115	115	121	107	67	73	65	62
Drying	23	16	18	7	0	1	1	0
Repairs, fuel and hire	<u>72</u>	<u>58</u>	<u>58</u>	<u>68</u>	<u>62</u>	<u>50</u>	<u>52</u>	<u>63</u>
Total variable costs.....	\$392	\$397	\$407	\$383	\$195	\$212	\$202	\$219
Percent change from 2016	-3%	-1%	0%	-1%	-3%	0%	1%	2%
Other nonland costs								
Labor	\$48	\$49	\$49	\$63	\$43	\$46	\$48	\$57
Buildings	28	17	17	23	14	15	12	13
Storage	8	15	12	6	3	8	5	4
Machinery depreciation	66	64	65	70	57	56	56	67
Nonland interest	54	53	50	48	45	48	43	45
Overhead	<u>52</u>	<u>47</u>	<u>47</u>	<u>52</u>	<u>51</u>	<u>44</u>	<u>45</u>	<u>50</u>
Total, other costs.....	\$256	\$245	\$240	\$262	\$213	\$217	\$209	\$236
Total, nonland costs	\$648	\$642	\$647	\$645	\$408	\$429	\$411	\$455
Percent change from 2016.....	0%	0%	1%	1%	2%	2%	1%	3%
LAND COSTS								
Total land costs ³	\$228	\$226	\$198	\$161	\$228	\$226	\$198	\$161
TOTAL, all costs	\$876	\$868	\$845	\$806	\$636	\$655	\$609	\$616
Percent change from 2016.....	-1%	0%	0%	1%	0%	1%	0%	2%
2017 yields, bushels per acre	219	227	220	169	59	68	61	54
Nonland costs per bushel	\$2.96	\$2.83	\$2.94	\$3.82	\$6.92	\$6.31	\$6.73	\$8.43
Total, all costs per bushel	\$4.00	\$3.82	\$3.84	\$4.77	\$10.78	\$9.63	\$9.98	\$11.41
2013-2017 average yield	209	217	204	172	61	65	60	53
Nonland costs per bushel	\$3.10	\$2.96	\$3.17	\$3.76	\$6.67	\$6.60	\$6.87	\$8.55
Total, all costs per bushel	\$4.19	\$4.01	\$4.14	\$4.70	\$10.39	\$10.08	\$10.18	\$11.58

Note: The last two lines of the table are costs based on 2013-2017 average yields

¹ Soil productivity ratings of 86 to 100

² Soil productivity ratings of 56 to 85

³ Weighted average of owned, crop share and cash rent land costs