Costs to Produce Corn and Soybeans in Illinois—2020

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In 2020, the total of all economic costs per acre for growing corn in Illinois averaged $869 in the northern section, $893 in the central section for farmland with "high" soil ratings, $850 in the central section for farmland with "low" soil ratings, and $808 in the southern section. Soybean costs per acre were $632, $661, $607 and $608, 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 $4.17 to $4.39 for corn and from $10.02 to $10.67 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 1,692 tillable acres in northern Illinois, 1,516 acres in the central section with high soil ratings, 1,461 acres in the central section with lower soil ratings, and 1,660 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 $3,900 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 2020 was set at 4 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 26 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 2020, the land interest charge was 1.85 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 2020 as compared to 2019 were lower in all regions of the state. Costs per bushel were lower due to higher yields and lower nonland interest costs. Costs per bushel were 25 cents lower in northern Illinois, 21 cents lower in central Illinois with the higher rated soils, 47 cents lower in central Illinois with the lower rated soils and 43 cents higher in southern Illinois.

The average corn yield in 2020 was 9 bushels per acre higher than 2019 in northern Illinois, 6 bushels to 12 bushel higher in central Illinois and 12 bushels higher than 2019 in southern Illinois. The 2020 average corn yield in the different geographical locations ranged from 10 bushels lower to 9 bushel per acre higher than the five-year average from 2016 to 2020.

Costs **per acre** for corn were lower in all the different geographic regions in Illinois compared to 2019. Across the state, total costs per acre to produce corn varied from 1 to 4 percent decrease. Nonland interest decreased the most statewide, while some areas experienced decreases in drying and fertility costs.

Production costs **per bushel** of soybeans in 2020 decreased in Illinois in comparison to 2019. Costs per bushel decreased due to higher yields and lower nonland interest costs. Soybean yields ranged from 2 to 3 bushels per acre higher in 2020 compared to 2019. Changes in costs per bushel ranged from $1.45 lower in southern Illinois to 33 cents lower in northern Illinois.

Total costs **per acre** mostly decreased in Illinois when compared to 2019. Costs increased $2 per acre in northern Illinois, decreased $12 per acre in central Illinois with the higher rated soils, decreased $21 per acre in central Illinois with the lower rated soils and decreased $21 per acre in southern Illinois when compared to 2019. Average soybean yields in the different areas ranged from 2 bushels lower to 1 bushel higher per acre when comparing to the five-year average from 2016 to 2020.

State Averages

Total costs to produce corn for all combined areas of the state were $868 per acre. This is $20 per acre lower than 2019. Variable costs decreased $10 per acre or 2 percent, other nonland costs decreases $14 per acre, and land costs increased $4 per acre. In 2020, cash costs accounted for 47 percent of the total cost of production for corn, other nonland costs were 27 percent, and land costs were 25 percent. The average corn

yield for all combined areas of the state was 203 bushels per acre resulting in a total cost of production of $4.28 per bushel. The average corn yield in 2020 was the second lowest in the last 5 years, but 9 bushels to the acre more than 2019. Total costs per acre were the second highest in the last five years while total costs per bushel were the second highest in the last five years as well.

Total cost per acre to produce soybeans decreased, from $648 per acre in 2019 to $635 per acre in 2020. Nonland interest accounted for most of the decrease. Variable cash costs accounted for 33 percent of the total cost of production for soybeans, other nonland costs 32 percent and land costs 35 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 $10.24 per bushel. The cost per bushel to raise soybeans the last five years averaged $10.14 per bushel.

Cost Comparison

Average variable costs per bushel of corn for the five-year period 2016 through 2020 ranged from $1.85 in central Illinois with the higher rated soils to $2.21 in southern Illinois. Total costs per bushel ranged from $3.98 in central Illinois with the higher rated soils to $4.64 in southern Illinois. Total costs per bushel were higher in southern Illinois due to lower yields.

Average variable costs per bushel of soybeans for the five-year period 2016 through 2020 ranged from $3.18 in central Illinois with higher rated soils to $3.90 in southern Illinois. Total costs per bushel varied from $9.72 in central Illinois with the higher rated soils to $11.12 in southern Illinois. Like for corn, soybeans total cost per bushel were higher in southern Illinois due to lower yields.

2021 Forecast

Forecasts for Illinois production costs in 2021 look to increase using Gary Schnitkey's 2021 crop budgets and the USDA's Cost-of-Production Forecasts as a guide. For corn, 2021 variable costs are projected to increase 1 percent, mainly due to soil fertility costs. However, this increase will greatly depend on when fertilizer was purchased. For 2021, soybeans have a larger projected percentage increase of variable costs of 5 percent. This increase is also primarily due to soil fertility costs. These increases coupled with monitoring overhead and land costs will be offset with currently higher projected grain prices for 2021.

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 217-333-8346 or visit the FBFM website at www.fbfm.org.

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

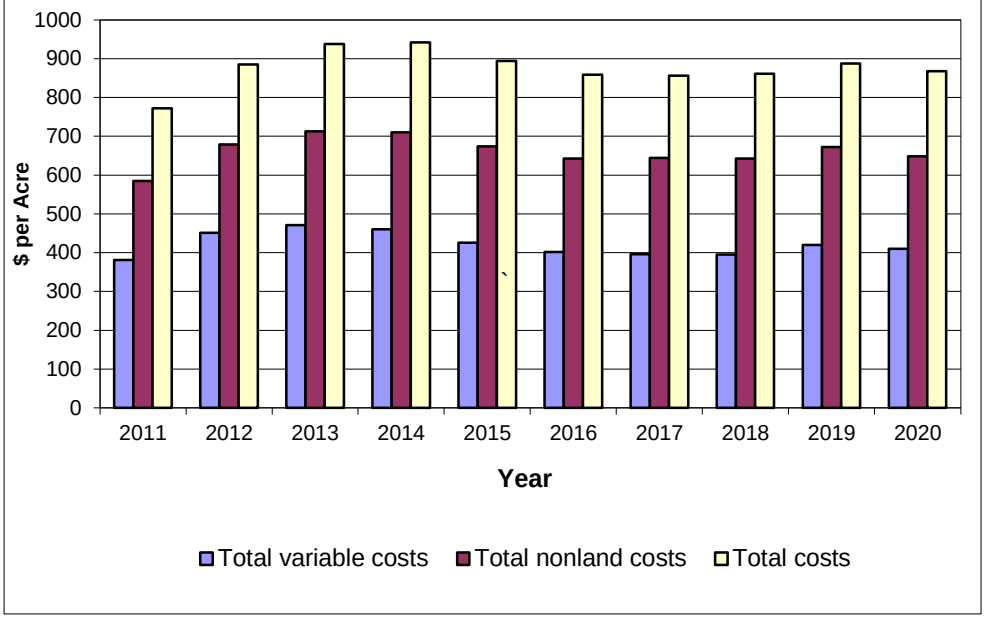

Figure 2. Total Costs Per Acre To Grow Soybeans On Illinois Grain Farms

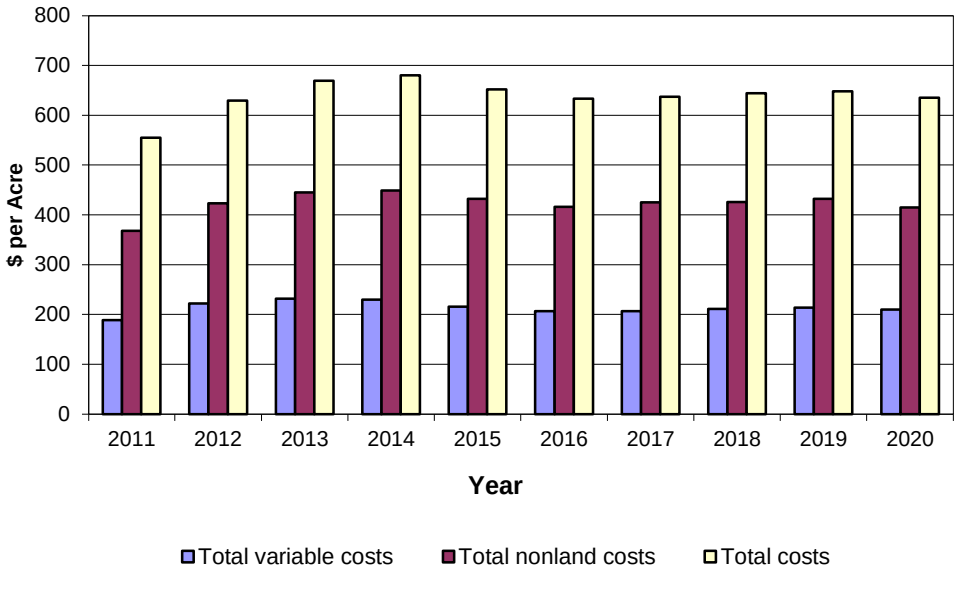

Table 1. Cost Per Acre for Growing Corn and Soybeans on Illinois Grain Farms Without Livestock in 2020

	Corn				Soybeans			
	Northern	Central [1] High	Central [2] Low	Southern	Northern	Central [1] High	Central [2] Low	Southern
Number of Farms	337	510	282	173	337	510	282	173
Acres in crop	1,042	770	749	738	603	723	685	780
NONLAND COSTS								
Variable Costs:								
Soil Fertility	$132	$143	$144	$133	$34	$42	$40	$39
Pesticides	59	78	75	70	35	47	46	48
Seed	109	112	116	104	64	71	61	64
Drying	18	22	18	10	-	-	1	-
Repairs, fuel and hire	81	66	63	71	69	57	56	63
Total variable costs	$399	$421	$416	$388	$202	$217	$204	$214
Percent change from 2019	-1%	-3%	-3%	-1%	3%	-2%	-2%	-4%
Other nonland costs								
Labor	$46	$48	$48	$64	$40	$45	$46	$59
Buildings	23	19	19	25	12	16	13	14
Storage	9	10	9	5	4	5	3	4
Machinery depreciation	58	65	63	71	50	56	55	68
Nonland interest	45	48	45	43	37	43	39	41
Overhead	48	48	46	50	46	45	43	46
Total, other costs	$229	$238	$230	$258	$189	$210	$199	$232
Total, nonland costs	$628	$659	$646	$646	$391	$427	$403	$446
Percent change from 2019	-2%	-4%	-5%	-3%	-1%	-4%	-4%	-4%
LAND COSTS								
Total land costs[3]	$241	$234	$204	$162	$241	$234	$204	$162
TOTAL, all costs	$869	$893	$850	$808	$632	$661	$607	$608
Percent change from 2019	-1%	-2%	-4%	-2%	0%	-2%	-3%	-3%
2020 yields, bushels per acre	200	214	199	184	60	66	60	57
Nonland costs per bushel	$3.14	$3.08	$3.25	$3.51	$6.52	$6.47	$6.72	$7.82
Total, all costs per bushel	$4.35	$4.17	$4.27	$4.39	$10.53	$10.02	$10.12	$10.67
2016-2020 average yield	209	223	209	175	62	69	61	56
Nonland costs per bushel	$3.00	$2.96	$3.10	$3.69	$6.31	$6.22	$6.58	$8.02
Total, all costs per bushel	$4.15	$4.01	$4.07	$4.61	$10.19	$9.64	$9.92	$10.94

Note: The last two lines of the table are costs based on 2016-2020 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