

Costs to Produce Corn and Soybeans in Illinois—2021

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In 2021, the total of all economic costs per acre for growing corn in Illinois averaged \$952 in the northern section, \$960 in the central section for farmland with “high” soil ratings, \$908 in the central section for farmland with “low” soil ratings, and \$876 in the southern section. Soybean costs per acre were \$704, \$716, \$660 and \$668, 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 \$4.19 to \$4.51 for corn and from \$9.94 to \$10.67 for soybeans. Variations in these costs 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 1,625 tillable acres in northern Illinois, 1,550 acres in the central section with high soil ratings, 1,511 acres in the central section with lower soil ratings, and

1,885 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 business. 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 \$4,000 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 2021 was set at 3.5 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 remaining economic depreciation 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 2021, the land interest charge was 1.80 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 2021 as compared to 2020 were higher in all regions of the state besides southern Illinois. Costs were lower in southern Illinois due to much higher yields. Costs per bushel were increased even with higher yields due to greater fertility, pesticides, overhead costs as well as machinery repairs, fuel and machine hire costs. Costs per bushel were 17 cents higher in northern Illinois, 17 cents higher in central Illinois with the higher rated soils, 16 cents higher in central Illinois with the lower rated soils and 20 cents lower in southern Illinois.

The average corn yield in 2021 was 11 bushels per acre higher than 2020 in northern Illinois, 6 bushels to 7 bushel higher in central Illinois and 25 bushels higher than 2020 in southern Illinois. The 2021 average corn yield in the different geographical locations ranged from one bushel lower to 25 bushels per acre higher than the five-year average from 2017 to 2021.

Costs **per acre** for corn were higher in all the different geographic regions in Illinois compared to 2020. Across the state, total costs per acre to produce corn increased from 7 to 10 percent. Land and pesticide costs increased the most statewide.

Production costs **per bushel** of soybeans in 2021 in Illinois compared to 2020 varied across the state. Costs per bushel increased in northern Illinois because of higher seed costs and in the central section of Illinois with lower soil ratings due to less of an increase in yields. Costs were lower in central Illinois with higher soil ratings and southern Illinois due to a higher increase in yields. Soybean yields ranged from 5 to 7 bushels per acre higher in 2021 compared to 2020. Changes in costs per bushel ranged from 23 cents lower in southern Illinois to 14 cents higher in northern Illinois.

Total costs **per acre** for soybeans increased in Illinois when compared to 2020. Costs increased \$72 per acre in northern Illinois, \$56 per acre in central Illinois with the higher rated soils, \$53 per acre in central Illinois with the lower rated soils and \$60 per acre in southern Illinois when compared to 2020. Average soybean yields in the different areas ranged from 3 to 7 bushel higher per acre when comparing to the five-year average from 2017 to 2021.

State Averages

Total costs to produce corn for all combined areas of the state were \$937 per acre. This

is \$69 per acre higher than 2020. Variable costs increased \$34 per acre or 8 percent, other nonland costs increased \$14 per acre, and land costs increased \$21 per acre. In 2021, cash costs accounted for 47 percent of the total cost of production for corn, other nonland costs were 27 percent, and land costs were 26 percent. The average corn yield for all combined areas of the state was 213 bushels per acre resulting in a total cost of production of \$4.40 per bushel. The average corn yield in 2021 was the highest in the last 3 years and 10 bushels to the acre more than 2020. Total costs per acre were the highest since 2013 while total costs per bushel were the second highest in the last five years.

Total cost per acre to produce soybeans increased, from \$635 per acre in 2020 to \$693 per acre in 2021. 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 68 bushels per acre resulting in a total cost of production of \$10.19 per bushel. The cost per bushel to raise soybeans the last five years averaged \$10.23 per bushel.

Cost Comparison

Average variable costs per bushel of corn for the five-year period 2017 through 2021 ranged from \$2.04 in central Illinois with the higher rated soils to \$2.31 in southern Illinois. Total costs per bushel ranged from \$4.34 in central Illinois with the higher rated soils to \$4.75 in southern Illinois. Total costs per bushel were higher in southern Illinois due to lower yields over the five-year period from 2017 through 2021.

Average variable costs per bushel of soybeans for the five-year period 2017 through 2021 ranged from \$3.42 in central Illinois with higher rated soils to \$4.27 in

southern Illinois. Total costs per bushel varied from \$10.41 in central Illinois with the higher rated soils to \$11.68 in southern Illinois. Like for corn, soybeans total cost per bushel were higher in southern Illinois due to lower yields during the most recent five-year period.

2022 Forecast

Forecasts for Illinois production costs in 2022 look to increase using Gary Schnitkey's 2022 crop budgets and the USDA's Cost-of-Production Forecasts as a guide. For corn, 2022 variable costs are projected to increase 39 percent, mainly due to soil fertility costs. However, this increase could be more depending on when fertilizer was purchased. For 2022, soybeans have a larger projected percentage increase of variable costs of 46 percent. This increase is also primarily due to soil fertility costs. These increases coupled with monitoring overhead and land costs have the possibility to be offset with currently higher projected grain prices for 2022.

Acknowledgment

The author would like to acknowledge that data used in this study comes from Illinois Farm Business Farm Management (FBFM) Associations across the state. 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 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

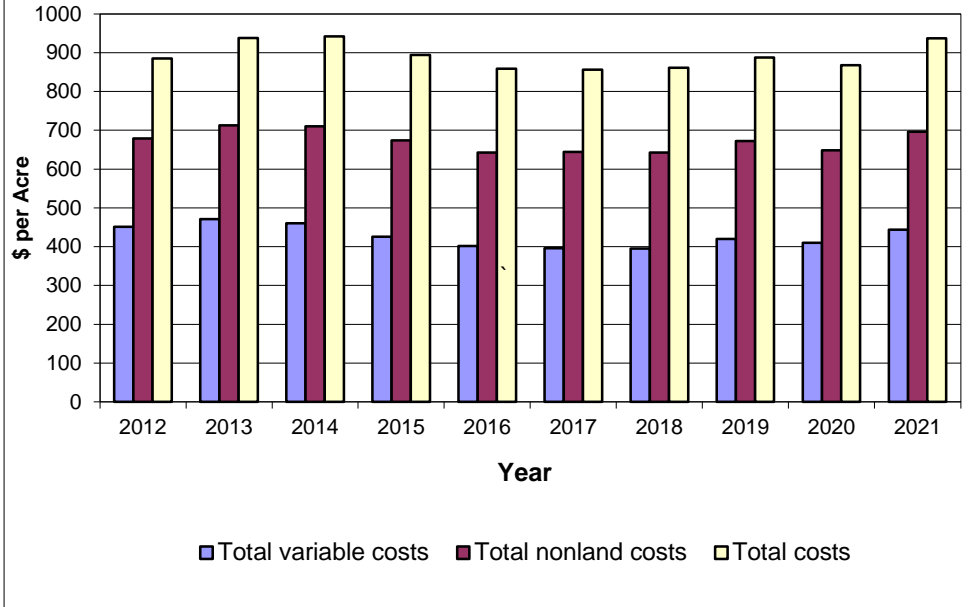


Figure 2. Total Costs Per Acre To Grow Soybeans On Illinois Grain Farms

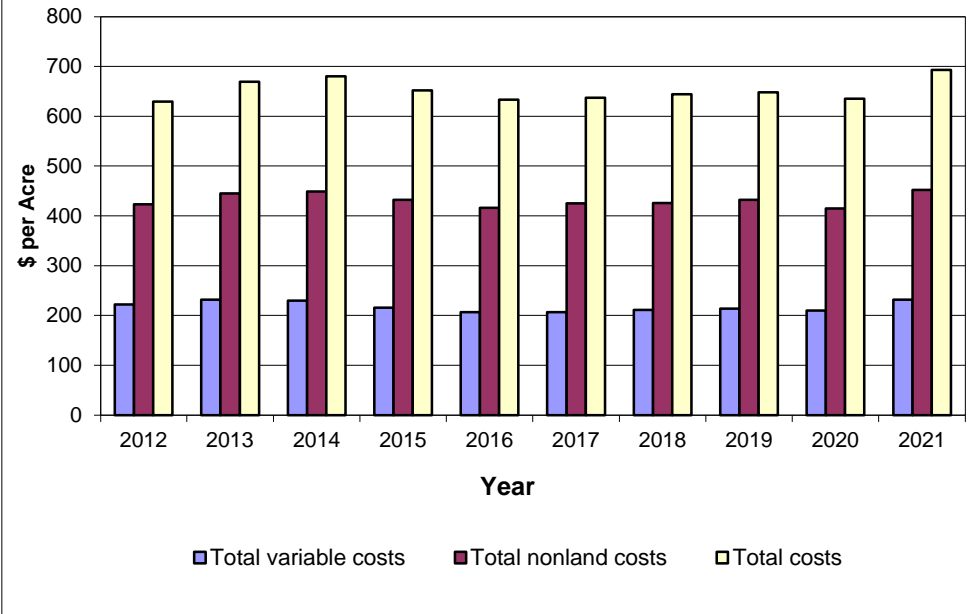


Table 1. Cost Per Acre for Growing Corn and Soybeans on Illinois Grain Farms Without Livestock in 2021

	Corn				Soybeans			
	Northern	Central ¹ High	Central ² Low	Southern	Northern	Central ¹ High	Central ² Low	Southern
Number of Farms	333	530	284	168	333	530	284	168
Acres in crop	937	780	767	784	643	753	712	910
NONLAND COSTS								
Variable Costs:								
Soil Fertility	\$141	\$154	\$151	\$148	\$38	\$45	\$42	\$50
Pesticides	79	90	87	80	47	54	54	55
Seed	116	114	114	101	71	72	60	65
Drying	16	20	14	11	-	-	1	-
Repairs, fuel and hire	<u>91</u>	<u>74</u>	<u>73</u>	<u>86</u>	<u>78</u>	<u>64</u>	<u>65</u>	<u>74</u>
Total variable costs.....	\$443	\$452	\$439	\$426	\$234	\$235	\$222	\$244
Percent change from 2020	11%	7%	6%	10%	16%	9%	9%	14%
Other nonland costs								
Labor	\$50	\$50	\$51	\$62	\$44	\$47	\$48	\$57
Buildings	25	18	20	24	13	15	14	14
Storage	3	6	5	4	1	3	2	3
Machinery depreciation	67	69	67	69	58	60	58	66
Nonland interest	46	47	44	43	38	42	38	41
Overhead	<u>62</u>	<u>59</u>	<u>59</u>	<u>60</u>	<u>60</u>	<u>55</u>	<u>55</u>	<u>55</u>
Total, other costs.....	\$253	\$249	\$246	\$262	\$214	\$222	\$215	\$236
Total, nonland costs	\$696	\$701	\$685	\$688	\$448	\$457	\$437	\$480
Percent change from 2020.....	11%	7%	6%	6%	15%	7%	8%	8%
LAND COSTS								
Total land costs ³	\$256	\$259	\$223	\$188	\$256	\$259	\$223	\$188
TOTAL, all costs	\$952	\$960	\$908	\$876	\$704	\$716	\$660	\$668
Percent change from 2020.....	10%	8%	7%	8%	12%	9%	9%	10%
2021 yields, bushels per acre	211	221	205	209	66	72	65	64
Nonland costs per bushel	\$3.30	\$3.17	\$3.34	\$3.29	\$6.79	\$6.35	\$6.72	\$7.50
Total, all costs per bushel	\$4.51	\$4.34	\$4.43	\$4.19	\$10.67	\$9.94	\$10.15	\$10.44
2017-2021 average yield	207	221	206	184	62	69	62	57
Nonland costs per bushel	\$3.36	\$3.17	\$3.33	\$3.73	\$7.23	\$6.64	\$7.09	\$8.39
Total, all costs per bushel	\$4.60	\$4.34	\$4.41	\$4.75	\$11.35	\$10.41	\$10.71	\$11.68

Note: The last two lines of the table are costs based on 2017-2021 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