
Estimated Costs of Crop Production in Iowa—2024

The estimated costs of corn, corn silage, soybeans, alfalfa, and pasture maintenance in this report are based on data from several sources. They include the annual Iowa Farm Business Association record summaries, production and costs data from the Departments of Economics, Agricultural and Biosystems Engineering, and Agronomy at Iowa State University, and a survey of selected agricultural cooperatives and other input suppliers around the state.

These cost estimates intend to represent average costs for farms in Iowa. Very large or small farms may have lower or higher fixed costs per acre. Starting in 2023, projected land costs are based on the previous year's results in the [Cash Rental Rates for Iowa Survey](https://store.extension.iastate.edu/product/1841), store.extension.iastate.edu/product/1841, and a poll of the Iowa State University Extension and Outreach Farm Management team and Farm Financial Associates.

Due to differences in soil potentials, quantity of inputs used, and other factors, production costs will vary from farm to farm. Price shifts for inputs can change production costs in both the short and long run. The data reflect average cost of purchased inputs and a return to land and labor resources, but do not provide a margin for profit or a return to management. They reflect production costs only, and do not include costs of storage.

Labor has been treated as a fixed cost because most labor on Iowa farms is supplied by the operator, family, or permanent hired labor. However, when deciding among alternative crops, labor should be considered a variable cost. The wage rate used here is \$19.00 per hour. The hours assumed per crop are presented in the budgets. The hours per crop acre include not only the field work but also time for maintenance, travel, and other activities related to crop production. The land charge is based on a projected cash rent equivalent. Owned land may require a greater or lesser cash outlay.

In the short run, cash income must be sufficient to pay cash costs, including seed, fertilizer, chemicals, insurance, cash rent, and hired labor, as well as machinery fuel and repairs, and interest on operating capital. In the long run, income should be sufficient to pay all costs of production for resources to be used in their most profitable purpose.

Starting in 2019, reference yields for corn and soybeans budgets reflect 30-year trend yields and are updated annually. Corn yields reflect rotation effects. Fertilizer rates have been adjusted to reflect current data on removal and application rates. Starting in 2021, nitrogen rates on corn budgets reflect recommendations from the [Corn Nitrogen Calculator](http://www.cornnratecalc.org), www.cornnratecalc.org. For 2024, the projected corn to nitrogen price ratio is 8.25. Crop insurance costs reflect revenue crop protection at 80% coverage for a typical farm in Central Iowa.

Machinery costs reflect both new and used equipment. The machine operations assumed are based on the 2016 Crop Production Practices Survey conducted by the Iowa Agricultural Statistics Service and ISU Extension and Outreach publication: [Estimating the Field Capacity of Farm Machines](https://store.extension.iastate.edu/product/4032), store.extension.iastate.edu/product/4032. In 2024, machinery costs were adjusted to reflect the 23% increase between 2020 and 2022 reported by [USDA Economic Research Service](https://www.ers.usda.gov/data-products/commodity-costs-and-returns/), www.ers.usda.gov/data-products/commodity-costs-and-returns/, in the budget line “Capital recovery of machinery and equipment” for corn production in the Heartland Region.

Estimates represent typical costs and are only intended to be guidelines. Actual costs will vary considerably and can be entered in the column for “Your Estimates.” Decision Tool spreadsheets for developing crop production budgets are available on the [Ag Decision Maker website](http://www.extension.iastate.edu/agdm), www.extension.iastate.edu/agdm.

Budgets for alfalfa hay establishment with an oat companion crop and by direct seeding are included in this publication. Annual production costs for established alfalfa or alfalfa-grass hay, as well as a budget for maintaining grass pastures, are included. The APH-90 insurance policy for oats was discontinued in 2022 and Yield Protection was offered for the first time in 2023.

Two low-till budgets, one for corn and one for soybeans, are included. The major differences between the low-till and conventional budgets are the preharvest machinery, labor, herbicide, and seeding costs. The soybean budgets are for herbicide-tolerant varieties. A strip-till budget is also included.

Corn Following Corn

	167 bushels per acre		185 bushels per acre		204 bushels per acre		Your Estimate
	Fixed	Variable	Fixed	Variable	Fixed	Variable	
Preharvest Machinery ^{1/}	\$38.50	\$28.30	\$38.50	\$28.30	\$38.50	\$28.30	\$
Seed, Chemical, etc.	Units		Units		Units		
Seed, \$3.66 per 1,000 kernels	28,000	\$102.48	30,000	\$109.80	35,000	\$128.10	\$
Nitrogen, \$0.60 per pound	172	103.20	183	109.80	194	116.40	
Phosphate, \$0.67 per pound	63	42.21	69	46.23	77	51.59	
Potash, \$0.53 per pound	50	26.50	56	29.68	61	32.33	
Lime (yearly cost)		11.05		11.05		11.05	
Herbicide		45.00		45.00		45.00	
Insecticide		20.00		20.00		20.00	
Crop insurance		15.90		17.50		18.90	
Miscellaneous		10.90		12.20		13.30	
Interest on preharvest variable costs (8 months at 8.5%)		22.98		24.34		26.35	
Total		\$400.22		\$425.60		\$463.02	\$
Harvest Machinery							
Combine	\$21.50	\$9.00	\$21.50	\$9.00	\$21.50	\$9.00	\$
Grain cart	10.40	3.90	10.40	3.90	10.40	3.90	
Haul	12.02	8.18	13.32	9.07	14.69	10.00	
Dry (LP gas, \$1.55 per gallon)	8.35	31.06	9.25	34.41	10.20	37.94	
Handle (auger)	4.93	4.36	5.46	4.83	6.02	5.32	
Total	\$57.20	\$56.50	\$59.93	\$61.20	\$62.81	\$66.16	\$
Labor							
2.80 hours, \$19.00 per hour	\$53.20		\$53.20		\$53.20		\$
Land							
Cash rent equivalent	\$242.00		\$285.00		\$331.00		\$
Total fixed, variable							
Per acre	\$390.90	\$485.02	\$436.63	\$515.11	\$485.51	\$557.48	Yield: bushels per acre
Per bushel	\$2.34	\$2.90	\$2.36	\$2.78	\$2.38	\$2.73	
Total cost per acre	\$875.92		\$951.73		\$1,042.99		\$
Total cost per bushel	\$5.25		\$5.14		\$5.11		\$

^{1/} Chisel plow, tandem disk, apply nitrogen, field cultivate, plant, and spray. See the Estimated Machinery Costs table.

Corn Following Soybeans

	182 bushels per acre		202 bushels per acre		222 bushels per acre		Your Estimate
	Fixed	Variable	Fixed	Variable	Fixed	Variable	
Preharvest Machinery ^{1/}	\$32.50	\$23.10	\$32.50	\$23.10	\$32.50	\$23.10	\$
Seed, Chemical, etc.	Units		Units		Units		
Seed, \$3.66 per 1,000 kernels	28,000	\$102.48	30,000	\$109.80	35,000	\$128.10	\$
Nitrogen, \$0.60 per pound	128	76.80	140	84.00	151	90.60	
Phosphate, \$0.67 per pound	68	45.56	76	50.92	83	55.61	
Potash, \$0.53 per pound	55	29.15	61	32.33	67	35.51	
Lime (yearly cost)		11.05		11.05		11.05	
Herbicide		45.00		45.00		45.00	
Crop insurance		15.90		17.50		18.90	
Miscellaneous		10.90		12.20		13.30	
Interest on preharvest variable costs (8 months at 8.5%)		20.40		21.87		23.87	
Total		\$357.24		\$384.67		\$421.94	\$
Harvest Machinery							
Combine	\$21.50	\$9.00	\$21.50	\$9.00	\$21.50	\$9.00	\$
Grain cart	10.40	3.90	10.40	3.90	10.40	3.90	
Haul	13.10	8.92	14.54	9.90	15.98	10.88	
Dry (LP gas, \$1.55 per gallon)	9.10	33.85	10.10	37.57	11.10	41.29	
Handle (auger)	5.37	4.75	5.96	5.27	6.55	5.79	
Total	\$59.47	\$60.42	\$62.50	\$65.64	\$65.53	\$70.86	\$
Labor							
2.55 hours, \$19.00 per hour	\$48.45		\$48.45		\$48.45		\$
Land							
Cash rent equivalent	\$242.00		\$285.00		\$331.00		\$
Total fixed, variable							
Per acre	\$382.42	\$440.76	\$428.45	\$473.41	\$477.48	\$515.90	Yield: bushels per acre
Per bushel	\$2.10	\$2.42	\$2.12	\$2.34	\$2.15	\$2.32	
Total cost per acre	\$823.18		\$901.86		\$993.38		\$
Total cost per bushel	\$4.52		\$4.46		\$4.47		\$

^{1/}Apply nitrogen, tandem disk, field cultivate, plant, and spray. See the Estimated Machinery Costs table.

Corn Silage Following Corn

	21 tons per acre		24 tons per acre		26 tons per acre		Your Estimate
	Fixed	Variable	Fixed	Variable	Fixed	Variable	
Preharvest Machinery ^{1/}	\$38.50	\$28.30	\$38.50	\$28.30	\$38.50	\$28.30	\$
Seed, Chemical, etc.	Units		Units		Units		
Seed, \$3.66 per 1,000 kernels	32,200	\$117.85	34,500	\$126.27	40,250	\$147.32	\$
Nitrogen, \$0.60 per pound	147	88.20	161	96.60	174	104.40	
Phosphate, \$0.67 per pound	74	49.58	84	56.28	91	60.97	
Potash, \$0.53 per pound	189	100.17	216	114.48	234	124.02	
Lime (yearly cost)		11.05		11.05		11.05	
Herbicide		45.00		45.00		45.00	
Insecticide		20.00		20.00		20.00	
Crop insurance		15.90		17.50		18.90	
Miscellaneous		10.90		12.20		13.30	
Interest on preharvest variable costs (8 months at 8.5%)		27.59		29.90		32.48	
Total		\$486.24		\$529.28		\$577.44	\$
Harvest Machinery							
Silage harvester	\$80.80	\$41.30	\$80.80	\$41.30	\$80.80	\$41.30	\$
Haul	46.83	35.70	53.52	40.80	57.98	44.20	
Store silage (unloader)	14.70	3.57	16.80	4.08	18.20	4.42	
Total	\$142.33	\$80.57	\$151.12	\$86.18	\$156.98	\$89.92	\$
Labor							
4.95 hours, \$19.00 per hour	\$94.05		\$94.05		\$94.05		\$
Land							
Cash rent equivalent	\$242.00		\$285.00		\$331.00		\$
Total fixed, variable							
Per acre	\$516.88	\$595.11	\$568.67	\$643.76	\$620.53	\$695.66	Yield: tons per acre
Per ton	\$24.61	\$28.34	\$23.69	\$26.82	\$23.87	\$26.76	
Total cost per acre	\$1,111.99		\$1,212.43		\$1,316.19		\$
Total cost per ton	\$52.95		\$50.52		\$50.62		\$

^{1/}Chisel plow, tandem disk, apply nitrogen, field cultivate, plant, and spray. See the Estimated Machinery Costs table.

Herbicide Tolerant Soybeans Following Corn

	53 bushels per acre		59 bushels per acre		65 bushels per acre		Your Estimate
	Fixed	Variable	Fixed	Variable	Fixed	Variable	
Preharvest Machinery ^{1/}	\$35.10	\$25.00	\$35.10	\$25.00	\$35.10	\$25.00	\$
Seed, Chemical, etc.	Units		Units		Units		
Seed, \$52.00 per 140,000 kernels	140,000	\$52.00	140,000	\$52.00	140,000	\$52.00	\$
Phosphate, \$0.67 per pound	42	28.14	47	31.49	52	34.84	
Potash, \$0.53 per pound	80	42.40	89	47.17	98	51.94	
Lime (yearly cost)		11.05		11.05		11.05	
Herbicide		53.50		53.50		53.50	
Crop insurance		9.80		11.10		12.20	
Miscellaneous		10.90		12.20		13.30	
Interest on preharvest variable costs (8 months at 8.5%)		13.19		13.80		14.38	
Total		\$220.98		\$232.31		\$243.21	\$
Harvest Machinery							
Combine	\$13.70	\$5.50	\$13.70	\$5.50	\$13.70	\$5.50	\$
Grain cart	10.40	3.90	10.40	3.90	10.40	3.90	
Haul	3.82	2.60	4.25	2.89	4.68	3.19	
Handle (auger)	1.56	1.38	1.74	1.54	1.92	1.70	
Total	\$29.48	\$13.38	\$30.09	\$13.83	\$30.70	\$14.28	\$
Labor							
2.20 hours, \$19.00 per hour	\$41.80		\$41.80		\$41.80		\$
Land							
Cash rent equivalent	\$242.00		\$285.00		\$331.00		\$
Total fixed, variable							
Per acre	\$348.38	\$259.36	\$391.99	\$271.14	\$438.60	\$282.50	Yield: bushels per acre
Per bushel	\$6.57	\$4.89	\$6.64	\$4.60	\$6.75	\$4.35	
Total cost per acre	\$607.74		\$663.13		\$721.09		\$
Total cost per bushel	\$11.47		\$11.24		\$11.09		\$

^{1/} Chisel plow, tandem disk, field cultivate, plant, and two sprays. See the Estimated Machinery Costs table.

^{2/} Estimates do not include any insecticide or fungicide costs.

Strip Tillage Corn and Soybeans

Corn Following Soybeans				Herbicide Tolerant Soybeans Following Corn			
	202 bushels per acre		Your Estimate		59 bushels per acre		Your Estimate
	Fixed	Variable			Fixed	Variable	
Preharvest Machinery ^{1/}	\$18.40	\$13.10	\$	Preharvest Machinery ^{1/}	\$22.40	\$15.30	\$
Seed, Chemical, etc.	Units			Seed, Chemical, etc.	Units		
Seed, \$3.66 per 1,000 kernels	30,000	\$109.80	\$	Seed, \$52.00 per 140,000 kernels	160,000	\$59.43	\$
Nitrogen, \$0.60 per pound	140	84.00					
Phosphate, \$0.67 per pound	76	50.92		Phosphate, \$0.67 per pound	47	31.49	
Potash, \$0.53 per pound	61	32.33		Potash, \$0.53 per pound	89	47.17	
Lime (yearly cost)		11.05		Lime (yearly cost)		11.05	
Herbicide ^{2/}		67.00		Herbicide ^{2/}		63.00	
Crop insurance		17.50		Crop insurance		11.10	
Miscellaneous		12.20		Miscellaneous		12.20	
Interest on preharvest variable costs (8 months at 8.5%)		22.55		Interest on preharvest variable costs (8 months at 8.5%)		14.21	
Total		\$407.35	\$	Total		\$249.65	\$
Harvest Machinery							
Combine	\$21.50	\$9.00	\$	Combine	\$13.70	\$5.50	\$
Grain cart	10.40	3.90		Grain cart	10.40	3.90	
Haul	14.54	9.90		Haul	4.25	2.89	
Dry (LP gas, \$1.55 per gallon)	10.10	37.57					
Handle (auger)	5.96	5.27		Handle (auger)	1.74	1.54	
Total	\$62.50	\$65.64	\$	Total	\$30.09	\$13.83	\$
Labor							
2.25 hours, \$19.00	\$42.75		\$	1.70 hours, \$19.00	\$32.30		\$
Land							
Cash rent equivalent	\$285.00		\$	Cash rent equivalent	\$285.00		\$
Total fixed, variable							
Per acre	\$408.65	\$486.09	Yield: bushels per acre	Per acre	\$369.79	\$278.78	Yield: bushels per acre
Per bushel	\$2.02	\$2.41		Per bushel	\$6.27	\$4.73	
Total cost per acre	\$894.74		\$	Total cost per acre	\$648.57		\$
Total cost per bushel	\$4.43		\$	Total cost per bushel	\$10.99		\$

^{1/} Strip till, plant, and spray for corn. No-till drill, two sprays for soybeans. See the Estimated Machinery Costs table.

^{2/} Estimates do not include any insecticide or fungicide costs.

Non-Herbicide Tolerant Soybeans Following Corn

	Soybeans Following Corn			Drilled Soybeans Following Corn		
	59 bushels per acre		Your Estimate	59 bushels per acre		Your Estimate
	Fixed	Variable		Fixed	Variable	
Preharvest Machinery ^{1/}	\$35.80	\$25.50	\$	\$30.70	\$20.90	\$
Seed, Chemical, etc.	Units			Units		
Seed, \$36.50 per 140,000 kernels	130,000	\$33.90	\$	150,000	\$39.10	\$
Phosphate, \$0.67 per pound	47	31.49		47	31.49	
Potash, \$0.53 per pound	89	47.17		89	47.17	
Lime (yearly cost)		11.05			11.05	
Herbicide ^{2/}		60.50			63.00	
Crop insurance		11.10			11.10	
Miscellaneous		12.20			12.20	
Interest on preharvest variable costs (8 months at 8.5%)		13.20			13.37	
Total		\$220.61	\$		\$228.48	\$
Harvest Machinery						
Combine	\$13.70	\$5.50	\$	\$13.70	\$5.50	\$
Grain cart	10.40	3.90		10.40	3.90	
Haul	4.25	2.89		4.25	2.89	
Handle (auger)	1.74	1.54		1.74	1.54	
Total	\$30.09	\$13.83	\$	\$30.09	\$13.83	\$
Labor						
2.40 hours, \$19.00 per hour	\$45.60		\$			
1.72 hours, \$19.00 per hour				\$32.68		\$
Land						
Cash rent equivalent	\$285.00		\$	\$285.00		\$
Total fixed, variable						
Per acre	\$396.49	\$259.94		\$378.47	\$263.21	
Per bushel	\$6.72	\$4.41	Yield: bushels per acre	\$6.41	\$4.46	Yield: bushels per acre
Total cost per acre	\$656.43		\$	\$641.68		\$
Total cost per bushel	\$11.13		\$	\$10.88		\$

^{1/} Chisel plow, tandem disk, field cultivate, plant, cultivate, and spray.
Tandem disk, field cultivate, drill, and spray for drilled soybeans. See the Estimated Machinery Costs table.
^{2/} Estimates do not include any insecticide or fungicide costs.

Low-till Corn and Soybeans

Corn Following Soybeans				Herbicide Tolerant Drilled Soybeans Following Corn			
	202 bushels per acre		Your Estimate		59 bushels per acre		Your Estimate
	Fixed	Variable			Fixed	Variable	
Preharvest Machinery ^{1/}	\$24.90	\$18.50	\$	Preharvest Machinery ^{1/}	\$22.50	\$15.20	\$
Seed, Chemical, etc.	Units			Seed, Chemical, etc.	Units		
Seed, \$3.66 per 1,000 kernels	30,000	\$109.80	\$	Seed, \$52.00 per 140,000 kernels	160,000	\$59.40	\$
Nitrogen, \$0.60 per pound	140	84.00					
Phosphate, \$0.67 per pound	76	50.92		Phosphate, \$0.67 per pound	47	31.49	
Potash, \$0.53 per pound	61	32.33		Potash, \$0.53 per pound	89	47.17	
Lime (yearly cost)		11.05		Lime (yearly cost)		11.05	
Herbicide ^{2/}		67.00		Herbicide ^{2/}		63.00	
Crop insurance		17.50		Crop insurance		11.10	
Miscellaneous		12.20		Miscellaneous		12.20	
Interest on preharvest variable costs (8 months at 8.5%)		22.85		Interest on preharvest variable costs (8 months at 8.5%)		14.20	
Total		\$407.65	\$	Total		\$249.61	\$
Harvest Machinery							
Combine	\$21.50	\$9.00	\$	Combine	\$13.70	\$5.50	\$
Grain cart	10.40	3.90		Grain cart	10.40	3.90	
Haul	14.54	9.90		Haul	4.25	2.89	
Dry (LP gas, \$1.55 per gallon)	10.10	37.57					
Handle (auger)	5.96	5.27		Handle (auger)	1.74	1.54	
Total	\$62.50	\$65.64	\$	Total	\$30.09	\$13.83	\$
Labor							
2.25 hours, \$19.00	\$42.75		\$	1.70 hours, \$19.00	\$32.30		\$
Land							
Cash rent equivalent	\$285.00		\$	Cash rent equivalent	\$285.00		\$
Total fixed, variable							
Per acre	\$415.15	\$491.80	Yield: bushels per acre	Per acre	\$369.89	\$278.64	Yield: bushels per acre
Per bushel	\$2.06	\$2.43		Per bushel	\$6.27	\$4.72	
Total cost per acre	\$906.95		\$	Total cost per acre	\$648.53		\$
Total cost per bushel	\$4.49		\$	Total cost per bushel	\$10.99		\$

^{1/} Apply nitrogen, cultivate, plant, and spray for corn. Disk, drill, and spray for soybeans. See the Estimated Machinery Costs table.

^{2/} Estimates do not include any insecticide or fungicide costs.

Oats and Hay Production-Seeding Year Costs

Establishment Costs	Alfalfa-Grass Seeded with Oat Companion Crop ^{1/}		Alfalfa Seeded with Herbicide ^{2/}		Your Estimate
	Fixed	Variable	Fixed	Variable	
Preharvest Machinery					
Spray herbicide			\$3.70	\$2.60	\$
Tandem disk (2 times)	\$15.20	\$9.20	15.20	9.20	
Spread fertilizer	3.30	2.10	3.30	2.10	
Harrow	3.40	2.00	3.40	2.00	
Seed (drill)	7.50	5.40	7.50	5.40	
Total preharvest machinery	\$29.40	\$18.70	\$33.10	\$21.30	\$
Seed ^{3/}					
Oats	2 bushels	\$23.00			\$
Alfalfa	8 pounds	34.72	15 pounds	\$65.10	
Bromegrass	6 pounds	24.90			
Orchardgrass	3 pounds	10.05			
Total seed cost		\$92.67		\$65.10	\$
Herbicide				\$25.10	\$
Lime (total cost for hay lifetime)		\$38.00		38.00	
Labor: 1 hour, \$19.00 per hour	\$19.00		\$19.00		\$
Total establishment costs	\$48.40	\$149.37	\$52.10	\$149.50	\$
Annual Costs	Fixed	Variable	Fixed	Variable	Your Estimate
One-third of Establishment Costs (for establishment year)	\$16.13	\$49.79	\$17.37	\$49.83	\$
Fertilizer					
Nitrogen	60 pounds	\$36.00			\$
Phosphorus	45 pounds	30.15	35 pounds	\$23.45	
Potash	130 pounds	68.90	125 pounds	66.25	
Total fertilizer		\$135.05		\$89.70	\$
Insurance, oats		\$3.70			\$
Labor, \$19.00 per hour	4 hours	\$76.00	3 hours	\$57.00	\$
Land: Cash rent equivalent	\$157.00		\$157.00		\$
Harvest Machinery					
Oats: combine and haul grain	\$18.16	\$8.02			\$
Oats: rake, bale, and haul straw	20.18	12.43			
Alfalfa: mower-conditioner, rake, bale, and haul hay	30.73	19.13	\$63.03	\$40.23	
Total harvest cost	\$69.08	\$39.58	\$63.03	\$40.23	\$
Total fixed and variable costs	\$318.21	\$228.12	\$294.40	\$179.77	\$
Total cost per acre	\$546.34		\$474.17		\$

^{1/} Assumes 80 bushels oat yield, one ton straw yield, and one ton per acre alfalfa yield from one cutting.

^{2/} Assumes two-and-a-half tons per acre from two alfalfa cuttings with herbicide-assisted seeding.

^{3/} Omit oats from August seedings. Higher priced seed varieties or different seed mixtures could vary these costs by 1.2 to 2.0 times.

Annual Production Costs for Established Alfalfa or Alfalfa-Grass Hay

	Hay Production Level				Your Estimate
	4 tons per acre ^{1/}		6 tons per acre ^{1/}		
	Fixed	Variable	Fixed	Variable	
One-third of establishment costs Machinery, seed, lime, labor, and herbicide ^{2/}	\$16.13	\$49.79	\$17.37	\$49.83	\$
Annual fertilizer ^{3/} 0-13-50 pounds per ton removed plus spreading and insurance	\$3.30	\$146.34	\$6.60	\$220.56	\$
Harvesting Costs: Large Round Bales ^{4/}					
Mower-conditioner, rake, baling, and hauling	\$95.33	\$61.33	\$129.20	\$84.40	\$
Labor costs: 1.33 hours per cutting, \$19.00 per hour	\$76.00		\$101.33		\$
Land: Cash rent equivalent	\$157.00		\$194.00		\$
Total fixed and variable cost using large round bales per acre	\$347.77	\$257.46	\$448.50	\$354.79	\$
Fixed, variable cost per ton	\$86.94	\$64.37	\$74.75	\$59.13	\$
Total cost per acre	\$605.23		\$803.29		\$
Total cost per ton	\$151.31		\$133.88		\$
Harvesting Costs: Small Square Bales ^{4/}					
Mower-conditioner, rake, baling, haul and stack	\$90.94	\$58.62	\$123.51	\$80.98	\$
Labor costs: 2 hours per cutting, \$19.00 per hour	\$114.00		\$152.00		\$
Land: Cash rent equivalent	\$157.00		\$194.00		\$
Total fixed and variable cost using small square bales per acre	\$381.37	\$254.75	\$493.47	\$351.38	\$
Fixed, variable cost per ton	\$95.34	\$63.69	\$82.25	\$58.56	\$
Total cost per acre	\$636.12		\$844.85		\$
Total cost per ton	\$159.03		\$140.81		\$

^{1/} For harvest as silage, use machine cost estimates from the Estimated Machinery Costs table.

^{2/} Assumes alfalfa-grass seeded with oat companion crop. If alfalfa seeded with preplant herbicide, then use other costs (see previous page).

^{3/} For 6-ton yield goal, a split application of fertilizer is assumed.

^{4/} Harvest cost estimates assume 3 cuttings for 4 tons and 4 cuttings for 6 tons.

Maintaining Grass Pastures - Annual Cost per Acre

	Improved Grass ^{2/}		Improved Grass-Legume ^{3/}		Your Estimate
	Fixed	Variable	Fixed	Variable	
Machinery Costs					
Spreading fertilizer	\$3.30	\$2.10	\$3.30	\$2.10	\$
Spraying herbicide	3.70	2.60			
Clipping weeds	11.00	5.60	11.00	5.60	
Total machinery cost	\$18.00	\$10.30	\$14.30	\$7.70	\$
Fertilizer and Herbicide ^{1/}					
Nitrogen, \$0.60 per pound	80 pounds	\$48.00			\$
Phosphate, \$0.67 per pound	30 pounds	20.10	30 pounds	\$20.10	
Potash, \$0.53 per pound			40 pounds	21.20	
Herbicide		4.75			
Total fertilizer and herbicide		\$72.85		\$41.30	\$
Labor					
Growing practices .5 hours, \$19.00 per hour	\$9.50		\$9.50		\$
Fence maintenance 1 hours, \$19.00 per hour	19.00		19.00		
Total labor	\$28.50		\$28.50		\$
Land					
Cash rent equivalent	\$67.00		\$95.00		\$
Total annual cost	\$113.50	\$83.15	\$137.80	\$49.00	\$
Total annual cost per acre		\$196.65		\$186.80	\$

^{1/} These are average rates and may vary with soil test and the level of management on a particular field. Different herbicide alternatives could vary this cost.

^{2/} Improved grass pastures assume a dominance of cool season grasses such as smooth bromegrass, orchardgrass, tall fescue, or reed canarygrass.

^{3/} Improved grass-legume pasture assumed one-third of the forage is made up of red clover, birdsfoot trefoil, or alfalfa.

Estimated Machinery Costs

The following cost estimates are for on-farm use, excluding labor. Depreciation is based on current replacement cost; interest is based on average market rates. Fixed costs will be greater for newer machinery. If annual machine use is greater than that assumed, fixed costs per acre will be lower, and vice versa. Hauling costs are based on a round trip of one mile. Remember these are estimates and they should not take the place of accurate recordkeeping. **Diesel fuel is estimated to cost \$3.38 per gallon, delivered to the farm in bulk.**

Operation	Hours of Use Assumed per Year	Fixed Cost (depreciation, interest, insurance, housing)	Variable Cost (fuel, oil, repairs)
Subsoiling (V-ripper)	120	\$10.40 /acre	\$10.10 /acre
Moldboard plow	120	15.10 /acre	12.70 /acre
Chisel plow	120	6.00 /acre	5.20 /acre
Chop stalks	120	8.20 /acre	6.40 /acre
Tandem disk	120	7.60 /acre	4.60 /acre
Offset disk	120	6.40 /acre	4.30 /acre
Peg tooth harrow	60	3.40 /acre	2.00 /acre
Sprayer/disk	120	6.20 /acre	3.90 /acre
Field cultivator	120	4.40 /acre	3.60 /acre
Disk/field cultivator	120	4.40 /acre	3.50 /acre
Strip tiller	120	5.00 /acre	4.10 /acre
Bulk fertilizer spreader	60	3.30 /acre	2.10 /acre
NH3 applicator	120	7.10 /acre	5.90 /acre
Chisel plow, NH3 applicator	120	10.00 /acre	9.10 /acre
Grain drill	100	7.50 /acre	5.40 /acre
Broadcast seeder	100	4.90 /acre	2.30 /acre
Planter	100	9.70 /acre	6.40 /acre
No-till planter	100	12.40 /acre	8.30 /acre
No-till drill	100	15.00 /acre	10.10 /acre
Rotary hoe	60	3.00 /acre	1.50 /acre
Cultivator	120	4.40 /acre	3.10 /acre
Sprayer	150	3.70 /acre	2.60 /acre
Combine corn	180	21.50 /acre	9.00 /acre
Combine soybeans	120	13.70 /acre	5.50 /acre
Combine small grain	120	12.40 /acre	4.10 /acre
Haul grain (on farm)	600	0.072 /bushel	0.049 /bushel
Grain cart	200	10.40 /acre	3.90 /acre
Store grain (auger)		0.0295 /bushel	0.0261 /bushel
Silage harvester	200	80.80 /acre	41.30 /acre
Haul silage	140	2.23 /ton	1.70 /ton
Store silage (unloader)		0.70 /ton	0.17 /ton
Rotary mower	120	11.00 /acre	5.60 /acre
Mower-conditioner	120	9.00 /cutting/acre	5.70 /cutting/acre
Rake	120	5.20 /cutting/acre	2.60 /cutting/acre
Small square baler	120	11.60 /cutting/acre	5.60 /cutting/acre
Round baler	120	13.40 /cutting/acre	6.90 /cutting/acre
Large square baler	120	14.10 /cutting/acre	8.30 /cutting/acre
Windrower	200	5.00 /cutting/acre	2.80 /cutting/acre
Forage chopper	200	29.60 /acre	18.00 /acre
Haul small square bales	120	3.38 /ton	4.23 /ton
Haul large round bales	120	3.13 /ton	3.93 /ton

Estimated Crop Production Costs in Iowa, 2015-2024

	2015	2016	2017	2018	2019 ^{1/}	2020	2021	2022 ^{2/}	2023	2024
Corn Following Corn										
Machinery	\$144.99	\$129.92	\$119.83	\$132.80	\$134.38	\$128.46	\$126.73	\$146.56	\$202.49	\$187.93
Seed, chemicals, etc.	357.80	330.55	287.19	279.81	313.70	299.79	311.84	415.55	479.49	425.60
Labor	37.05	37.05	36.40	39.20	39.90	41.30	42.70	47.60	50.40	53.20
Land	273.00	266.00	230.00	219.00	223.00	219.00	222.00	232.00	285.00	285.00
Total cost per acre	812.83	763.52	673.41	670.80	710.98	688.54	703.28	841.70	1,017.38	951.73
Assumed yield	165 bu.	165 bu.	165 bu.	165 bu.	182 bu.	182 bu.	184 bu.	180 bu.	185 bu.	185 bu.
Total cost per bushel	\$4.93	\$4.63	\$4.08	\$4.07	\$3.91	\$3.78	\$3.82	\$4.68	\$5.50	\$5.14
Corn Following Soybeans										
Machinery	\$142.18	\$126.74	\$116.56	\$130.47	\$132.22	\$126.10	\$125.17	\$145.48	\$202.98	\$183.75
Seed, chemicals, etc.	311.84	292.47	251.48	241.86	279.96	259.59	278.36	363.93	434.31	384.67
Labor	33.80	33.80	33.15	35.70	36.34	37.61	38.89	43.35	45.90	48.45
Land	273.00	266.00	230.00	219.00	223.00	219.00	222.00	232.00	285.00	285.00
Total cost per acre	760.81	719.01	631.18	627.03	671.51	642.30	664.42	784.76	968.19	901.86
Assumed yield	180 bu.	180 bu.	180 bu.	180 bu.	198 bu.	199 bu.	201 bu.	198 bu.	202 bu.	202 bu.
Total cost per bushel	\$4.23	\$3.99	\$3.51	\$3.48	\$3.39	\$3.23	\$3.31	\$3.96	\$4.79	\$4.46
Soybeans Following Corn ^{3/}										
Machinery	\$79.17	\$75.43	\$67.40	\$68.67	\$68.43	\$68.11	\$63.86	\$72.74	\$86.05	\$104.02
Seed, chemicals, etc.	166.38	162.63	157.11	154.41	183.61	168.52	181.24	232.82	286.76	232.31
Labor	29.25	29.25	28.60	30.80	31.35	32.45	33.55	37.40	39.60	41.80
Land	273.00	266.00	230.00	219.00	223.00	219.00	222.00	232.00	285.00	285.00
Total cost per acre	547.80	533.30	483.11	472.89	506.38	488.09	500.65	574.96	697.41	663.13
Assumed yield	50 bu.	50 bu.	50 bu.	50 bu.	56 bu.	56 bu.	56 bu.	57 bu.	59 bu.	59 bu.
Total cost per bushel	\$10.96	\$10.67	\$9.66	\$9.46	\$9.04	\$8.72	\$8.94	\$10.09	\$11.82	\$11.24
Alfalfa Hay, annual production, 6 ton per acre, large round bales										
One-third of est. costs	\$60.62	\$57.93	\$60.03	\$51.43	\$48.50	\$49.65	\$51.97	\$68.97	\$65.57	\$67.20
Annual fertilizer	166.88	148.21	109.05	121.48	135.37	129.37	129.37	228.76	289.65	227.16
Harvest machinery	167.60	159.20	140.80	144.40	141.60	141.20	130.80	150.00	179.20	213.60
Labor	69.33	69.33	69.33	74.67	76.00	78.67	81.33	90.67	96.00	101.33
Land	167.00	170.00	165.00	157.00	157.00	160.00	164.00	174.00	209.00	194.00
Total cost per acre	631.43	604.67	544.22	548.97	558.47	558.89	557.47	712.39	839.42	803.29
Assumed yield	6 ton	6 ton	6 ton	6 ton	6 ton	6 ton	6 ton	6 ton	6 ton	6 ton
Total cost per ton	\$105.24	\$100.78	\$90.70	\$91.49	\$93.08	\$93.15	\$92.91	\$118.73	\$139.90	\$133.88

^{1/} Starting in 2019, reference yields for corn and soybean budgets reflect 30-year trend yields.

^{2/} Starting in 2022, nitrogen fertilizer rates are adjusted according to the [Corn Nitrogen Rate Calculator](http://www.cornnitrocalc.org), www.cornnitrocalc.org.

^{3/} Soybean estimates are for herbicide tolerant varieties.

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