
Estimated Costs of Crop Production in Iowa – 2021

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 are representative of average costs for farms in Iowa. Very large or small farms may have lower or higher fixed costs per acre.

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 \$15.25 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 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 alternative.

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://cnrc.agron.iastate.edu/), <http://cnrc.agron.iastate.edu/>. For 2021, the projected corn to nitrogen price ratio is 12.35. Crop insurance costs reflect revenue crop protection at 80% coverage for a typical farm in Central Iowa. Starting in 2020, the average cost of lime is adjusted to account for regional differences in lime application practices (ag lime quality, quantity, and frequency of application).

Machinery costs reflect both new and used equipment. The machine operations assumed are based on the 2000 Crop Production Practices Survey conducted by the Iowa Agricultural Statistics Service and Iowa State University Extension and Outreach publication PM 696: [Estimating the Field Capacity of Farm Machines](https://store.extension.iastate.edu/product/4032), <https://store.extension.iastate.edu/product/4032>. The Estimated Machinery Costs table can be used to budget other tillage and harvesting systems.

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.” Electronic spreadsheets for developing crop production budgets are available on the [Ag Decision Maker](http://www.extension.iastate.edu/agdm) website, 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.

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 soybeans budgets are for herbicide tolerant varieties. A strip-till budget is also included.

Corn Following Corn

	166 bushels per acre		184 bushels per acre		202 bushels per acre		Your Estimate
	Fixed	Variable	Fixed	Variable	Fixed	Variable	
Preharvest Machinery ^{1/}	\$22.10	\$19.60	\$22.10	\$19.60	\$22.10	\$19.60	\$
Seed, Chemical, etc.	Units		Units		Units		
Seed @ \$3.27 per 1000 kernels	28,000	\$91.56	30,000	\$98.10	35,000	\$114.45	\$
Nitrogen @ \$0.34 per pound	182	61.88	198	67.32	211	71.74	
Phosphate @ \$0.39 per pound	62	24.18	69	26.91	76	29.64	
Potash @ \$0.30 per pound	50	15.00	55	16.50	61	18.30	
Lime (yearly cost)		15.69		15.69		15.69	
Herbicide		39.58		39.58		39.58	
Insecticide		18.45		18.45		18.45	
Crop insurance		7.80		8.60		9.30	
Miscellaneous		9.00		10.00		11.00	
Interest on preharvest variable costs (8 months @ 5.0%)		10.09		10.69		11.59	
Total		\$293.23		\$311.84		\$339.74	\$
Harvest Machinery							
Combine	\$12.50	\$6.10	\$12.50	\$6.10	\$12.50	\$6.10	\$
Grain cart	5.90	2.70	5.90	2.70	5.90	2.70	
Haul	6.81	5.64	7.54	6.26	8.28	6.87	
Dry (LP gas @ \$1.30 per gallon)	8.30	25.90	9.20	28.70	10.10	31.51	
Handle (auger)	2.76	2.77	3.05	3.07	3.35	3.37	
Total	\$36.26	\$43.11	\$38.20	\$46.83	\$40.14	\$50.55	\$
Labor							
2.80 hours @ \$15.25	\$42.70		\$42.70		\$42.70		\$
Land							
Cash rent equivalent	\$187.00		\$222.00		\$256.00		\$
Total fixed, variable							
Per acre	\$288.06	\$355.95	\$325.00	\$378.28	\$360.94	\$409.90	Yield: bushels per acre
Per bushel	\$1.74	\$2.14	\$1.77	\$2.06	\$1.79	\$2.03	
Total cost per acre	\$644.01		\$703.28		\$770.83		\$
Total cost per bushel	\$3.88		\$3.82		\$3.82		\$

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

Corn Following Soybeans

	181 bushels per acre		201 bushels per acre		221 bushels per acre		Your Estimate
	Fixed	Variable	Fixed	Variable	Fixed	Variable	
Preharvest Machinery ^{1/}	\$18.70	\$16.10	\$18.70	\$16.10	\$18.70	\$16.10	\$
Seed, Chemical, etc.	Units		Units		Units		
Seed @ \$3.27 per 1000 kernels	28,000	\$91.56	30,000	\$98.10	35,000	\$114.45	\$
Nitrogen @\$0.34 per pound	133	45.22	146	49.64	159	54.06	
Phosphate @ \$0.39 per pound	68	26.52	75	29.25	83	32.37	
Potash @ \$0.30 per pound	54	16.20	60	18.00	66	19.80	
Lime (yearly cost)		15.69		15.69		15.69	
Herbicide		39.58		39.58		39.58	
Crop insurance		7.80		8.60		9.30	
Miscellaneous		9.00		10.00		11.00	
Interest on preharvest variable costs (8 months @5.0%)		8.92		9.50		10.41	
Total		\$260.49		\$278.36		\$306.66	\$
Harvest Machinery							
Combine	\$12.50	\$6.10	\$12.50	\$6.10	\$12.50	\$6.10	\$
Grain cart	5.90	2.70	5.90	2.70	5.90	2.70	
Haul	7.42	6.15	8.24	6.83	9.06	7.51	
Dry (LP gas @ \$1.30 per gallon)	9.05	28.24	10.05	31.36	11.05	34.48	
Handle (auger)	3.00	3.02	3.34	3.36	3.67	3.69	
Total	\$37.88	\$46.21	\$40.03	\$50.35	\$42.18	\$54.48	\$
Labor							
2.55 hours @ \$15.25	\$38.89		\$38.89		\$38.89		\$
Land							
Cash rent equivalent	\$187.00		\$222.00		\$256.00		\$
Total fixed, variable							
Per acre	\$282.46	\$322.81	\$319.62	\$344.81	\$355.77	\$377.24	Yield: bushels per acre
Per bushel	\$1.56	\$1.78	\$1.59	\$1.72	\$1.61	\$1.71	
Total cost per acre	\$605.27		\$664.42		\$733.01		\$
Total cost per bushel	\$3.34		\$3.31		\$3.32		\$

^{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/}	\$22.10	\$19.60	\$22.10	\$19.60	\$22.10	\$19.60	\$
Seed, Chemical, etc.	Units		Units		Units		
Seed @ \$3.27 per 1000 kernel	32,200	\$105.29	34,500	\$112.82	40,250	\$131.62	\$
Nitrogen @\$0.34 per pound	150	51.00	150	51.00	150	51.00	
Phosphate @ \$0.39 per pound	74	28.86	84	32.76	91	35.49	
Potash @ \$0.30 per pound	168	50.40	192	57.60	208	62.40	
Lime (yearly cost)		15.69		15.69		15.69	
Herbicide		39.58		39.58		39.58	
Insecticide		18.45		18.45		18.45	
Crop insurance		7.80		8.60		9.30	
Miscellaneous		9.00		10.00		11.00	
Interest on preharvest variable costs (8 months @5.0%)		11.52		12.20		13.14	
Total		\$337.59		\$358.71		\$387.67	\$
Harvest Machinery							
Silage harvester	\$47.10	\$28.50	\$47.10	\$28.50	\$47.10	\$28.50	\$
Haul	26.67	23.10	30.48	26.40	33.02	28.60	
Store silage (unloader)	8.40	2.73	9.60	3.12	10.40	3.38	
Total	\$82.17	\$54.33	\$87.18	\$58.02	\$90.52	\$60.48	\$
Labor							
4.95 hours @ \$15.25	\$75.49		\$75.49		\$75.49		\$
Land							
Cash rent equivalent	\$187.00		\$222.00		\$256.00		\$
Total fixed, variable							
Per acre	\$366.76	\$411.52	\$406.77	\$436.33	\$444.11	\$467.75	Yield: tons per acre
Per ton	\$17.46	\$19.60	\$16.95	\$18.18	\$17.08	\$17.99	
Total cost per acre	\$778.28		\$843.09		\$911.86		\$
Total cost per ton	\$37.06		\$35.13		\$35.07		\$

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

Herbicide Tolerant Soybeans Following Corn

	50 bushels per acre		56 bushels per acre		62 bushels per acre		Your Estimate
	Fixed	Variable	Fixed	Variable	Fixed	Variable	
Preharvest Machinery ^{1/}	\$20.10	\$17.40	\$20.10	\$17.40	\$20.10	\$17.40	\$
Seed, Chemical, etc.	Units		Units		Units		
Seed @\$49.20 per 140,000 kernel	140,000	\$49.20	140,000	\$49.20	140,000	\$49.20	\$
Phosphate @ \$0.39 per pound	40	15.60	45	17.55	50	19.50	
Potash @ \$0.30 per pound	75	22.50	84	25.20	93	27.90	
Lime (yearly cost)		15.69		15.69		15.69	
Herbicide		48.69		48.69		48.69	
Crop insurance		7.50		8.50		9.30	
Miscellaneous		9.00		10.00		11.00	
Interest on preharvest variable costs (8 months @5.0%)		6.19		6.41		6.62	
Total		\$174.37		\$181.24		\$187.91	\$
Harvest Machinery							
Combine	\$8.00	\$3.70	\$8.00	\$3.70	\$8.00	\$3.70	\$
Grain cart	5.90	2.70	5.90	2.70	5.90	2.70	
Haul	2.05	1.70	2.30	1.90	2.54	2.11	
Handle (auger)	0.83	0.84	0.93	0.94	1.03	1.04	
Total	\$16.78	\$8.94	\$17.13	\$9.24	\$17.47	\$9.54	\$
Labor							
2.20 hours @ \$15.25	\$33.55		\$33.55		\$33.55		\$
Land							
Cash rent equivalent	\$187.00		\$222.00		\$256.00		\$
Total fixed, variable							
Per acre	\$257.43	\$200.70	\$292.78	\$207.88	\$327.12	\$214.85	Yield: bushels per acre
Per bushel	\$5.15	\$4.01	\$5.23	\$3.71	\$5.28	\$3.47	
Total cost per acre	\$458.13		\$500.65		\$541.97		\$
Total cost per bushel	\$9.16		\$8.94		\$8.74		\$

^{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			
	201 bushels per acre		Your Estimate		56 bushels per acre		Your Estimate
	Fixed	Variable			Fixed	Variable	
Preharvest Machinery ^{1/}	\$10.50	\$9.20	\$	Preharvest Machinery ^{1/}	\$12.70	\$11.00	\$
Seed, Chemical, etc.	Units			Seed, Chemical, etc.	Units		
Seed @ \$3.27 per 1000 kernels	30,000	\$98.10	\$	Seed @ \$49.20 per 140,000 kernels	160,000	\$56.23	\$
Nitrogen @ \$0.34 per pound	146	49.64		Phosphate @ \$0.39 per pound	45	17.55	
Phosphate @ \$0.39 per pound	75	29.25		Potash @ \$0.30 per pound	84	25.20	
Potash @ \$0.30 per pound	60	18.00		Lime (yearly cost)		15.69	
Lime (yearly cost)		15.69		Herbicide ^{2/}		49.99	
Herbicide ^{2/}		46.21		Crop insurance		8.50	
Crop insurance		8.60		Miscellaneous		10.00	
Miscellaneous		10.00		Interest on preharvest variable costs (8 months @ 5.0%)		6.47	
Interest on preharvest variable costs (8 months @ 5.0%)		9.49		Total		\$189.63	\$
Total		\$284.98	\$	Total		\$189.63	\$
Harvest Machinery							
Combine	\$12.50	\$6.10	\$	Combine	\$8.00	\$3.70	\$
Grain cart	5.90	2.70		Grain cart	5.90	2.70	
Haul	8.24	6.83		Haul	2.30	1.90	
Dry (LP gas @ \$1.30 per gallon)	10.05	31.36		Handle (auger)	0.93	0.94	
Handle (auger)	3.34	3.36		Total	\$17.13	\$9.24	\$
Total	\$40.03	\$50.35	\$	Total	\$17.13	\$9.24	\$
Labor							
2.25 hours @ \$15.25	\$34.31		\$	1.70 hours @ \$15.25	\$25.93		\$
Land							
Cash rent equivalent	\$222.00		\$	Cash rent equivalent	\$222.00		\$
Total fixed, variable							
Per acre	\$306.84	\$344.53	Yield: bushels per acre	Per acre	\$277.75	\$209.87	Yield: bushels per acre
Per bushel	\$1.53	\$1.71		Per bushel	\$4.96	\$3.75	
Total cost per acre	\$651.37		\$	Total cost per acre	\$487.62		\$
Total cost per bushel	\$3.24		\$	Total cost per bushel	\$8.71		\$

^{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		
	56 bushels per acre		Your Estimate	56 bushels per acre		Your Estimate
	Fixed	Variable		Fixed	Variable	
Preharvest Machinery ^{1/}	\$20.50	\$17.60	\$	\$17.60	\$14.60	\$
Seed, Chemical, etc.	Units			Units		
Seed @ \$38.00 per 140,000 kernel	130,000	\$35.30	\$	150,000	\$40.70	\$
Phosphate @ \$0.39 per pound	45	17.55		45	17.55	
Potash @ \$0.30 per pound	84	25.20		84	25.20	
Lime (yearly cost)		15.69			15.69	
Herbicide ^{2/}		64.50			49.99	
Crop insurance		8.50			8.50	
Miscellaneous		10.00			10.00	
Interest on preharvest variable costs (8 months @ 5.0%)		6.48			6.07	
Total		\$183.22	\$		\$173.71	\$
Harvest Machinery						
Combine	\$8.00	\$3.70	\$	\$8.00	\$3.70	\$
Grain cart	5.90	2.70		5.90	2.70	
Haul	2.30	1.90		2.30	1.90	
Handle (auger)	0.93	0.94		0.93	0.94	
Total	\$17.13	\$9.24	\$	\$17.13	\$9.24	\$
Labor						
2.40 hours @ \$15.25	\$36.60		\$			
1.72 hours @ \$15.25				\$26.23		\$
Land						
Cash rent equivalent	\$222.00		\$	\$222.00		\$
Total fixed, variable						
Per acre	\$296.23	\$210.06		\$282.96	\$197.55	
Per bushel	\$5.29	\$3.75	Yield: bushels per acre	\$5.05	\$3.53	Yield: bushels per acre
Total cost per acre	\$506.29		\$	\$480.50		\$
Total cost per bushel	\$9.04		\$	\$8.58		\$

^{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						
		201 bushels per acre		Your Estimate			56 bushels per acre		Your Estimate	
		Fixed	Variable		Fixed	Variable				
Preharvest Machinery ^{1/}				\$14.30	\$13.00	\$	Preharvest Machinery ^{1/}			
							\$12.80	\$10.60	\$	
Seed, Chemical, etc.		Units			Seed, Chemical, etc.		Units			
Seed @ \$3.27 per 1000 kernels		30,000	\$98.10	\$	Seed @ \$49.20 per 140,000 kernels		160,000	\$56.23	\$	
Nitrogen @ \$0.34 per pound		146	49.64		Phosphate @ \$0.39 per pound		45	17.55		
Phosphate @ \$0.39 per pound		75	29.25		Potash @ \$0.30 per pound		84	25.20		
Potash @ \$0.30 per pound		60	18.00		Lime (yearly cost)			15.69		
Lime (yearly cost)			15.69		Herbicide ^{2/}			49.99		
Herbicide ^{2/}			46.21		Crop insurance			8.50		
Crop insurance			8.60		Miscellaneous			10.00		
Miscellaneous			10.00		Interest on preharvest variable costs (8 months @ 5.0%)			6.46		
Interest on preharvest variable costs (8 months @ 5.0%)			9.62		Total			\$189.62	\$	
Total			\$285.11	\$	Total			\$189.62	\$	
Harvest Machinery										
Combine		\$12.50	\$6.10	\$	Combine		\$8.00	\$3.70	\$	
Grain cart		5.90	2.70		Grain cart		5.90	2.70		
Haul		8.24	6.83		Haul		2.30	1.90		
Dry (LP gas @ \$1.30 per gallon)		10.05	31.36		Handle (auger)		0.93	0.94		
Handle (auger)		3.34	3.36		Total		\$17.13	\$9.24	\$	
Total		\$40.03	\$50.35	\$	Total		\$17.13	\$9.24	\$	
Labor										
2.25 hours @\$15.25		\$34.31		\$	1.70 hours @\$15.25		\$25.93		\$	
Land										
Cash rent equivalent		\$222.00		\$	Cash rent equivalent		\$222.00		\$	
Total fixed, variable										
Per acre		\$310.64	\$348.46	Yield: bushels per acre	Per acre		\$277.85	\$209.46	Yield: bushels per acre	
Per bushel		\$1.55	\$1.73		Per bushel		\$4.96	\$3.74		
Total cost per acre		\$659.10		\$	Total cost per acre		\$487.31		\$	
Total cost per bushel		\$3.28		\$	Total cost per bushel		\$8.70		\$	

^{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.

Oat 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			\$2.10	\$1.90	\$
Tandem disk (2 times)	\$8.80	\$6.20	8.80	6.20	
Spread fertilizer	1.80	1.40	1.80	1.40	
Harrow	2.00	1.30	2.00	1.30	
Seed (drill)	4.20	3.70	4.20	3.70	
Total preharvest machinery	\$16.80	\$12.60	\$18.90	\$14.50	\$
Seed ^{3/}					
Oat	2 bushels	\$19.20			\$
Alfalfa	8 pounds	33.04	15 pounds	\$61.95	
Bromegrass	6 pounds	16.56			
Orchardgrass	3 pounds	9.78			
Total seed cost		\$78.58		\$61.95	\$
Herbicide				\$17.30	\$
Lime (total cost for hay lifetime)		\$28.00		28.00	
Labor: 1 hour @ \$15.25	\$15.25		\$15.25		\$
Total establishment costs	\$32.05	\$119.18	\$34.15	\$121.75	\$
Annual Costs	Fixed	Variable	Fixed	Variable	Your Estimate
One-third of Establishment Costs (for establishment year)	\$10.68	\$39.73	\$11.38	\$40.58	\$
Fertilizer					
Nitrogen	60 pounds	\$20.40			\$
Phosphorus	45 pounds	17.55	35 pounds	\$13.65	
Potash	130 pounds	39.00	125 pounds	37.50	
Total fertilizer		\$76.95		\$51.15	\$
Insurance, oats		\$2.00			\$
Labor @ \$15.25	4 hours	\$61.00	3 hours	\$45.75	\$
Land: Cash rent equivalent	\$125.00		\$125.00		\$
Harvest Machinery					
Oat: combine and haul grain	\$10.48	\$5.52			\$
Oat: rake, bale, and haul straw	11.52	8.42			
Alfalfa: mower-conditioner, rake, bale, and haul hay	17.60	12.97	\$36.10	\$27.17	
Total harvest cost	\$39.60	\$26.90	\$36.10	\$27.17	\$
Total fixed and variable costs	\$236.29	\$145.58	\$218.23	\$118.90	\$
Total cost per acre		\$381.87		\$337.13	\$

^{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		
	Fixed	Variable	Fixed	Variable	
One-third of establishment costs Machinery, seed, lime, labor, and herbicide ^{2/}	\$10.68	\$39.73	\$11.38	\$40.58	\$
Annual fertilizer ^{3/} 0-13-50 pounds per ton removed plus spreading and insurance	\$1.80	\$83.38	\$3.60	\$125.77	\$
Harvesting Costs: Large Round Bales ^{4/}					
Mower-conditioner, rake, baling, and hauling	\$54.60	\$41.37	\$74.00	\$56.80	\$
Labor costs: 1.33 hours per cutting @ \$15.25 per hour	\$61.00		\$81.33		\$
Land: Cash rent equivalent	\$125.00		\$164.00		\$
Total fixed and variable cost using large round bales per acre	\$247.98	\$166.70	\$334.32	\$223.15	\$
Fixed, variable cost per ton	\$62.00	\$41.68	\$55.72	\$37.19	\$
Total cost per acre	\$414.68		\$557.47		\$
Total cost per ton	\$103.67		\$92.91		\$
Harvesting Costs: Small Square Bales ^{4/}					
Mower-conditioner, rake, baling, haul and stack	\$52.09	\$39.26	\$70.74	\$54.09	\$
Labor costs: 2 hours per cutting @ \$15.25 per hour	\$91.50		\$122.00		\$
Land: Cash rent equivalent	\$125.00		\$164.00		\$
Total fixed and variable cost using small square bales per acre	\$281.08	\$162.37	\$371.72	\$220.45	\$
Fixed, variable cost per ton	\$70.27	\$40.59	\$61.95	\$36.74	\$
Total cost per acre	\$443.44		\$592.17		\$
Total cost per ton	\$110.86		\$98.69		\$

^{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	\$1.80	\$1.40	\$1.80	\$1.40	\$
Spraying herbicide	2.10	1.90			
Clipping weeds	6.20	3.80	6.20	3.80	
Total machinery cost	\$10.10	\$7.10	\$8.00	\$5.20	\$
Fertilizer and Herbicide ^{1/}					
Nitrogen @ \$0.34 per pound	80 pounds	\$27.20			\$
Phosphate @ \$0.39 per pound	30 pounds	11.70	30 pounds	\$11.70	
Potash @ \$0.30 per pound			40 pounds	12.00	
Herbicide		2.90			
Total fertilizer and herbicide		\$41.80		\$23.70	\$
Labor					
Growing practices .5 hours @ \$15.25	\$7.63		\$7.63		\$
Fence maintenance 1 hours @ \$15.25	15.25		15.25		
Total labor	\$22.88		\$22.88		\$
Land					
Cash rent equivalent	\$56.00		\$77.00		\$
Total annual cost	\$88.98	\$48.90	\$107.88	\$28.90	\$
Total annual cost per acre	\$137.88		\$136.78		\$

^{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 record-keeping. **Diesel fuel is estimated to cost \$2.02 per gallon, delivered to the farm in bulk.**

Operation	Hours of Use Assumed per Year	Fixed Cost per Acre (depreciation, interest, insurance, housing)	Variable Cost per Acre (fuel, oil, repairs)
Subsoiling (V-ripper)	120	\$6.00	\$6.60
Moldboard plow	120	8.60	8.50
Chisel plow	120	3.40	3.50
Chop stalks	120	4.70	4.30
Tandem disk	120	4.40	3.10
Offset disk	120	3.70	2.90
Peg tooth harrow	60	2.00	1.30
Sprayer/disk	120	3.50	2.60
Field cultivator	120	2.60	2.40
Disk/Field cultivator	120	2.50	2.40
Strip tiller	120	2.90	2.70
Bulk fertilizer spreader	60	1.80	1.40
NH3 applicator	120	4.10	4.10
Chisel plow, NH3 applicator	120	5.70	6.40
Grain drill	100	4.20	3.70
Broadcast seeder	100	2.80	1.50
Planter	100	5.50	4.60
No-till planter	100	7.00	5.90
No-till drill	100	8.50	7.20
Rotary hoe	60	1.80	1.00
Cultivator	120	2.50	2.10
Sprayer	150	2.10	1.90
Combine corn	180	12.50	6.10
Combine soybeans	120	8.00	3.70
Combine small grain	120	7.20	2.80
Haul grain (on farm)	600	0.041/bushel	0.034/bushel
Grain cart	200	5.90	2.70
Store grain (auger)		0.0166/bushel	0.0167/bushel
Silage harvester	200	47.10	28.50
Haul silage	140	1.27/ton	1.10/ton
Store silage (unloader)		0.40/ton	0.13/ton
Rotary mower	120	6.20	3.80
Mower-conditioner	120	5.20	3.80
Rake	120	2.90	1.80
Small square baler	120	6.70/cutting	4.00/cutting
Round baler	120	7.70	4.90
Large square baler	120	8.20	5.90
Windrower	200	2.90	1.90
Forage chopper	200	17.00	12.60
Haul small square bales	120	1.92/ton	2.62/ton
Haul large round bales	120	1.80/ton	2.47/ton

Estimated Crop Production Costs in Iowa, 2012-2021

	2012	2013	2014	2015	2016	2017	2018	2019 ^{1/}	2020	2021
Corn Following Corn										
Machinery	\$147.37	\$147.37	\$155.29	\$144.99	\$129.92	\$119.83	\$132.80	\$134.38	\$128.46	\$126.73
Seed, chemicals, etc.	376.81	372.43	340.27	357.80	330.55	287.19	279.81	313.70	299.79	311.84
Labor	33.35	34.91	37.05	37.05	37.05	36.40	39.20	39.90	41.30	42.70
Land	258.00	276.00	287.00	273.00	266.00	230.00	219.00	223.00	219.00	222.00
Total cost per acre	815.53	830.70	819.61	812.83	763.52	673.41	670.80	710.98	688.54	703.28
Assumed yield	165 bu.	165 bu.	165 bu.	165 bu.	165 bu.	165 bu.	165 bu.	182 bu.	182 bu.	184 bu.
Total cost per bushel	\$4.94	\$5.03	\$4.97	\$4.93	\$4.63	\$4.08	\$4.07	\$3.91	\$3.78	\$3.82
Corn Following Soybeans										
Machinery	\$144.22	\$144.22	\$152.28	\$142.18	\$126.74	\$116.56	\$130.47	\$132.22	\$126.10	\$125.17
Seed, chemicals, etc.	329.14	324.61	298.80	311.84	292.47	251.48	241.86	279.96	259.59	278.36
Labor	30.42	31.85	33.80	33.80	33.80	33.15	35.70	36.34	37.61	38.89
Land	258.00	276.00	287.00	273.00	266.00	230.00	219.00	223.00	219.00	222.00
Total cost per acre	761.78	776.68	771.88	760.81	719.01	631.18	627.03	671.51	642.30	664.42
Assumed yield	180 bu.	180 bu.	180 bu.	180 bu.	180 bu.	180 bu.	180 bu.	198 bu.	199 bu.	201 bu.
Total cost per bushel	\$4.23	\$4.31	\$4.29	\$4.23	\$3.99	\$3.51	\$3.48	\$3.39	\$3.23	\$3.31
Soybeans Following Corn ^{2/}										
Machinery	\$80.70	\$80.70	\$84.70	\$79.17	\$75.43	\$67.40	\$68.67	\$68.43	\$68.11	\$63.86
Seed, chemicals, etc.	180.89	163.44	155.65	166.38	162.63	157.11	154.41	183.61	168.52	181.24
Labor	26.33	27.56	29.25	29.25	29.25	28.60	30.80	31.35	32.45	33.55
Land	258.00	276.00	287.00	273.00	266.00	230.00	219.00	223.00	219.00	222.00
Total cost per acre	545.91	547.71	556.60	547.80	533.30	483.11	472.89	506.38	488.09	500.65
Assumed yield	50 bu.	50 bu.	50 bu.	50 bu.	50 bu.	50 bu.	50 bu.	56 bu.	56 bu.	56 bu.
Total cost per bushel	\$10.92	\$10.95	\$11.13	\$10.96	\$10.67	\$9.66	\$9.46	\$9.04	\$8.72	\$8.94
Alfalfa Hay, annual production, 6 ton per acre, large round bales										
One-third of est. costs	\$52.48	\$54.25	\$58.17	\$60.62	\$57.93	\$60.03	\$51.43	\$48.50	\$49.65	\$51.97
Annual fertilizer	227.92	200.94	164.14	166.88	148.21	109.05	121.48	135.37	129.37	129.37
Harvest machinery	174.50	174.50	179.60	167.60	159.20	140.80	144.40	141.60	141.20	130.80
Labor	62.40	65.33	69.33	69.33	69.33	69.33	74.67	76.00	78.67	81.33
Land	150.00	161.00	167.00	167.00	170.00	165.00	157.00	157.00	160.00	164.00
Total cost per acre	667.30	656.02	638.24	631.43	604.67	544.22	548.97	558.47	558.89	557.47
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	\$111.22	\$109.34	\$106.37	\$105.24	\$100.78	\$90.70	\$91.49	\$93.08	\$93.15	\$92.91

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

^{2/} Soybean estimates are for herbicide tolerant varieties.

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