
2016 Iowa Farm Costs and Returns

Ag Decision Maker

File C1-10

The farm record data utilized in this report were obtained from the Iowa Farm Business Association. The average of all farms in each table represents a weighted average of the values for each size group listed. Weighting factors are based on the number of farms in each size group in the state, as computed from the most recent Census of Agriculture. Only farms with sales of \$100,000 or more were counted in making the weighting. Thus, overall averages should be representative of full-time Iowa farms.

All records were kept on the accrual, or inventory, basis. On rented farms, only operator income and expenses were recorded. Data for ending assets and liabilities represent those of the operator only, and do not include the value of rented land.

Definition of Terms Used

Net farm income, cash - total sales and other cash income minus cash expenses, including purchases of livestock and feed. Does not include principal borrowed or repaid, sales and purchases of capital assets, or nonfarm income and expenses.

Net farm income, accrual - cash net income adjusted for inventory changes and accrued expenses. Represents a return to unpaid labor, net worth (equity), management, and profit.

Value of farm production - value of crops produced (at market price), livestock production (net of feed and purchased livestock), inventory value gain or loss, and miscellaneous income. This measures the total production per farm.

Management return - accrual net farm income less four percent interest on value of equity (net worth) and wages for operator and family labor. The wage rate used for operator labor was \$2,500 per month.

Inventory value gain or loss - change in value of crops or livestock sold due to differences in opening inventory price and final sale price.

Livestock returns per \$100 feed fed - value of livestock production minus livestock purchases, divided by value of feed fed, multiplied by 100.

Machinery cost per crop acre - total of machinery repairs, fuel, custom machine hire, utilities, machinery depreciation, and auto expense, less 75 percent of all custom hire income received, divided by crop acres. Depreciation is estimated at 10 percent of current value of the machinery. Interest is not included.

Return on assets - net farm income, plus interest expense, minus value of operator and family labor, divided by total farm assets owned.

Return on equity - net farm income minus value of operator and family labor, divided by net worth.

Operating profit margin ratio - net farm income, plus interest expense, minus value of operator and family labor, divided by value of farm production.

Working capital - current assets minus current liabilities.



The data for this report were collected by Iowa Farm Business Association consultants and compiled by Iowa State University Extension and Outreach.

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Iowa Farm Costs and Returns 2012-2016

The following summary is intended to provide a general picture of costs and returns to well-managed, full-time Iowa farms. The values presented are averages; however, results vary widely from one farm to the next.

The average number of crop acres per farm declined by 15 acres in 2016, after four years of continued expansion. The average value of total farm assets declined by \$97,549 and the average farm net worth declined by six percent or \$110,153. The average accrual net farm income increased by \$17,670 to \$45,597 in 2016, driven by record yields. Livestock returns per \$100 feed fed declined by 13 percent to \$117 in 2016; while crop value per acre increased by eight percent to \$635. The average debt-to-asset ratio increased for a fourth consecutive year in 2016 to 0.22, the highest level since 2008. The average current asset-to-debt ratio, a relative measure of liquidity, decreased to 3.30 in 2015, the lowest level since 2006.

Table 1. Comparison by Years

	2016	2015 ^{2/}	2014	2013	2012 ^{1/}
Financial Returns					
Net farm income-accrual	\$45,597	\$27,927	\$99,177	\$71,595	\$243,072
Return to management	-63,620	-85,187	-8,922	-32,564	147,071
Net farm income-cash	92,500	94,990	143,158	184,949	214,411
Resources Used					
Acres in crops	694	707	692	662	631
Labor months	19	18	17	16	15
Livestock, feed, supplies	\$586,669	\$635,031	\$644,624	\$608,170	\$645,734
Machinery and equipment	500,782	517,123	452,453	409,991	343,356
Land and improvements	1,347,510	1,380,356	1,271,960	1,190,214	1,088,910
Total farm assets	\$2,434,961	\$2,532,510	\$2,369,037	\$2,208,375	\$2,078,000
Farm net worth	\$1,807,856	\$1,918,009	\$1,843,316	\$1,765,312	\$1,690,684
Value of Farm Production					
Livestock income less feed, purchases for resale	\$25,395	\$18,671	\$108,778	\$39,073	\$13,277
Crop production	455,336	431,461	486,806	562,763	577,676
Miscellaneous	97,375	118,214	60,255	43,046	39,626
Crop inventory gain or loss	-118	5,295	-27,271	-92,610	42,487
Value of farm production	\$577,989	\$573,641	\$628,569	\$552,272	\$673,066
Expenses					
Operating	\$283,007	\$285,204	\$294,344	\$273,314	\$268,190
Fixed	249,384	260,510	232,310	210,532	186,105
Efficiency					
Corn yield (bu. per acre)	209	200	184	169	149
Average sale price for corn, per bushel	\$3.43	\$3.71	\$4.32	\$6.35	\$6.45
Crop value per acre	\$635	\$588	\$667	\$821	\$882
Machinery cost per crop acre	\$131	\$133	\$139	\$150	\$149
Livestock returns per \$100 feed fed	\$117	\$133	\$223	\$145	\$102
Gross revenue per person	\$420,420	\$452,035	\$466,608	\$453,197	\$588,093
Gross revenue per \$1 expense	\$1.12	\$1.09	\$1.20	\$1.19	\$1.68
Gross revenue per \$1 assets	\$0.27	\$0.27	\$0.24	\$0.23	\$0.31
Return on assets (ROA)	1.7%	1.1%	2.5%	2.2%	10.6%
Return on equity (ROE)	1.0%	0.2%	2.4%	1.8%	11.8%
Financial					
Debt-to-asset ratio	0.22	0.21	0.19	0.17	0.16
Current asset-to-debt ratio	3.30	3.32	3.52	4.92	7.08
Farm net worth per acre farmed	\$2,872	\$2,897	\$2,805	\$2,881	\$2,765

^{1/} Revised using weights from the 2012 Census of Agriculture.

^{2/} Revised with additional farm data.

Assets and Liabilities

A breakdown of farm assets and liabilities by value of gross sales per farm is shown in Table 2. Both assets and liabilities increase with farm size. The total debt-to-asset ratio tends to increase with farm size, indicating that larger farms utilized relatively more credit and were more leveraged than smaller farms. The two groups of larger farms had higher total liabilities in 2016 than in 2015, but the two groups of smaller farms had lower total liabilities in 2016. Except for the second group of farms, all other groups experienced a decline in the value of total assets. Consequently, average farm net worth declined for all groups but the second smallest farms. Relative measures of liquidity suggest that smaller farms were better positioned to cover short term liabilities than larger farms. Average working capital declined by \$47,798 in 2016, accumulating a reduction of \$167,972 since 2012.

Table 2. Assets and Liabilities by Size of Farm, End of Year Values

	Average	Total Value of Gross Sales			
		\$100,000 to \$199,999	\$200,000 to \$399,999	\$400,000 to \$799,999	\$800,000 and above
Farm Assets					
Feeding livestock	\$101,051	\$4,222	\$7,945	\$18,718	\$314,796
Crop inventory	347,873	104,630	217,479	360,841	598,695
Cash	56,094	9,449	36,382	89,467	71,892
Supplies, prepaid expenses, other ^{1/}	81,650	24,249	46,345	92,032	138,130
Total short-term assets	\$586,669	\$142,551	\$308,152	\$561,058	\$1,123,513
Breeding livestock	\$29,930	\$6,022	\$14,611	\$18,825	\$67,857
Machinery, equipment	437,361	97,075	229,843	436,556	826,743
Other intermediate assets ^{2/}	33,490	11,367	35,162	10,048	66,883
Total intermediate assets	\$500,782	\$114,464	\$279,615	\$465,429	\$961,483
Land and improvements	\$1,347,510	\$697,795	\$924,306	\$1,354,256	\$2,106,573
Total assets	\$2,434,961	\$955,227	\$1,513,673	\$2,380,742	\$4,195,301
Farm Liabilities					
Operating notes, accounts payable	\$229,660	\$29,996	\$83,521	\$150,776	\$549,483
Intermediate and long-term due	5,865	812	2,402	4,778	12,940
Other short term debt ^{3/}	549	0	180	875	912
Total short-term debt	\$236,074	\$30,808	\$86,103	\$156,429	\$563,335
Intermediate-term debt	\$215,499	\$24,240	\$78,936	\$158,603	\$502,145
Long-term debt	\$177,120	\$57,932	\$106,557	\$158,575	\$328,114
Total liabilities	\$628,693	\$112,981	\$271,596	\$473,607	\$1,393,595
Farm Net Worth					
Farm net worth	\$1,807,856	\$842,247	\$1,242,076	\$1,907,135	\$2,801,706
Net worth change from last year	-\$110,153	-\$71,119	\$94,595	-\$69,539	-\$345,888
Working capital	\$350,595	\$111,743	\$222,048	\$404,629	\$560,178
Current asset-to-debt ratio	3.30	4.63	3.58	3.59	1.99
Working capital per \$1 of gross revenue	0.60	\$0.74	\$0.73	\$0.68	\$0.32
Total debt-to-asset ratio	0.22	0.12	0.18	0.20	0.33
Total crop acres farmed	694	213	419	721	1,204
Months of labor used	19	9	12	15	35
Farm net worth per acre farmed	\$2,872	\$3,949	\$2,965	\$2,647	\$2,327

^{1/} Purchased feed, accounts receivable, hedging accounts, sealed grain, investment in growing crops, short term loans.

^{2/} Capital leases, investment in cooperatives.

^{3/} Labor related liabilities, accrued interest, taxes payable, and other current liabilities.

Income and Expenses

A summary of operating and fixed expenses by size of farm is shown in Table 3. All expenses increase with farm size. Crop expenses include seed, fertilizer, pesticides, and other expenses related to crop production. The average farm generated a net farm cash flow of about \$98,000 for replacement of capital assets, expansion, savings, living expenses, and income taxes. That is \$13,000 less than in 2015.

Table 3. Summary of Cash Income and Expenses by Size of Farm

	Average	Total Value of Gross Sales			
		\$100,000 to \$199,999	\$200,000 to \$399,999	\$400,000 to \$799,999	\$800,000 and above
Income					
Livestock sales	\$254,228	\$6,870	\$11,564	\$45,481	\$802,951
Corn sales	226,997	70,467	130,060	254,732	382,098
Soybeans sales	172,238	53,065	107,336	183,644	291,450
Other crop sales	11,067	1,031	5,476	6,577	26,114
Other cash income	101,444	16,925	41,734	86,851	218,083
Total cash income	\$765,974	\$148,358	\$296,169	\$577,285	\$1,720,697
Expenses					
Machinery and equipment repairs	\$24,834	\$6,133	\$14,007	\$22,757	\$47,569
Fuel and oil	15,685	3,178	7,183	13,268	32,891
Machine hire	14,788	4,512	7,533	12,620	29,320
Auto and truck expense	5,182	1,826	3,428	4,646	9,245
Utilities	9,451	3,070	5,009	8,065	18,457
Labor hired	19,718	987	3,200	9,605	54,561
Livestock expense	26,296	949	1,459	6,306	81,239
Crop expense	163,237	48,404	94,090	169,852	287,688
Miscellaneous	3,817	1,340	2,275	3,505	6,954
Total cash operating expense	\$283,007	\$70,399	\$138,183	\$250,625	\$567,924
Cash rent	\$103,233	\$14,550	\$42,861	\$101,656	\$211,317
Property taxes	8,686	5,121	6,478	8,810	12,674
Insurance	21,857	6,797	12,035	21,093	40,290
Building repairs	7,068	1,677	4,418	6,485	13,204
Interest	27,377	5,241	13,301	19,360	60,363
Other overhead expenses	13,592	3,092	5,043	8,496	32,001
Total cash fixed expense	\$181,813	\$36,478	\$84,137	\$165,901	\$369,849
Feed purchased	\$111,593	\$3,110	\$10,629	\$27,657	\$340,731
Livestock purchased	97,060	2,041	3,473	10,757	313,664
Total cash expenses	\$673,474	\$112,029	\$236,422	\$454,939	\$1,592,168
Cash net farm income	\$92,500	\$36,329	\$59,747	\$122,345	\$128,529
Loans received minus loans repaid	\$5,219	\$10,212	-\$6,585	\$2,657	\$14,509
Net farm cash flow	\$97,719	\$46,541	\$53,162	\$125,002	\$143,038

A more accurate measure of net farm income is achieved by netting out changes in the values of beginning and ending inventories, subtracting a depreciation charge for farm assets, and including accrued income and expenses. A summary of income and expenses using accrual accounting is shown in Table 4. The average accrual net farm income ranged from \$25,322 for the smallest farms to \$74,513 for the second largest. Return to management, after subtracting a return to unpaid labor and equity capital invested, was negative for all farm sizes and averaged -\$63,620. Only ten percent of gross revenue was left as net farm income after all expenses were paid.

Table 4. Summary of Accrual Income and Expenses by Size of Farm^{1/}

	Average	Total Value of Gross Sales			
		\$100,000 to \$199,999	\$200,000 to \$399,999	\$400,000 to \$799,999	\$800,000 and above
Income					
Total cash income	\$765,974	\$148,358	\$296,169	\$577,285	\$1,720,697
Change in crop inventory	-118	2,002	7,539	9,812	-16,907
Change in livestock inventory	-24,176	-997	-6,881	-9,311	-66,720
Feed credits, change in other inventories	44,962	2,448	6,641	13,948	132,004
Total accrual income (gross revenue)	\$786,642	\$151,810	\$303,469	\$591,734	\$1,769,073
Total cash expenses	\$673,474	\$112,029	\$236,422	\$454,939	\$1,592,168
Depreciation	67,571	14,459	31,316	62,281	136,294
Total accrual expenses	\$741,045	\$126,488	\$267,737	\$517,221	\$1,728,462
Accrual net farm income	\$45,597	\$25,322	\$35,731	\$74,513	\$40,612
Charge for unpaid labor	29,312	19,776	26,905	30,495	36,226
Charge for equity capital (4%)	79,905	37,975	56,158	82,549	123,861
Return to management	-\$63,620	-\$32,429	-\$47,332	-\$38,530	-\$119,476
Allocation of gross revenue					
Operating expense	77%	70%	74%	74%	87%
Interest expense	4%	3%	4%	3%	3%
Depreciation expense	9%	10%	10%	11%	8%
Net farm income	10%	17%	12%	13%	2%
	100%	100%	100%	100%	100%

The value of all crops and livestock produced on the farm is shown in Table 5. The value of farm production increased by \$4,348 and averaged \$577,989 in 2016.

Table 5. Value of Farm Production by Size of Farm^{2/}

	Average	Total Value of Gross Sales			
		\$100,000 to \$199,999	\$200,000 to \$399,999	\$400,000 to \$799,999	\$800,000 and above
Value of livestock production	\$234,048	\$6,102	\$6,806	\$38,942	\$745,272
Less purchase for resale	97,060	2,041	3,473	10,757	313,664
Less purchased feed fed	111,593	3,110	10,629	27,657	340,731
Net value of livestock production	25,395	951	-7,296	528	90,877
Value of crop production (incl feed credits)	455,336	126,974	249,477	459,035	831,842
Miscellaneous income	97,375	16,732	39,647	83,945	208,867
Crop inventory change	-118	2,002	7,539	9,812	-16,907
Value of farm production	\$577,989	\$146,659	\$289,367	\$553,320	\$1,114,679

^{1/} Accrual net farm income = value of farm production - total cash fixed expense - total cash operating expense - depreciation

^{2/} Value of farm production = gross revenue - livestock purchase for resale - purchased feed fed

Efficiency Factors

Efficiency can be measured in many ways. Several efficiency factors are shown in Table 6 for the four farm size groups. The gross revenue per person increases with farm size, but gross revenue per dollar of expense was higher for small farms than for large farms. Return on equity averaged 1.0 percent, and return on investment averaged 1.7 percent.

Table 6. Overall Efficiency Factors by Size of Farm

	Average	Total Value of Gross Sales			
		\$100,000 to \$199,999	\$200,000 to \$399,999	\$400,000 to \$799,999	\$800,000 and above
Crops					
Acres in crops	694	213	419	721	1,204
Crop value per acre	\$635	\$595	\$596	\$637	\$691
Crop acres per person	435	300	421	564	415
Machinery cost per crop acre	\$131	\$137	\$134	\$129	\$127
Machinery investment per crop acre	\$486	\$444	\$494	\$516	\$480
Livestock					
Livestock returns per \$100 feed fed	\$117	\$101	\$98	\$126	\$134
Financial					
Gross revenue per person	\$420,420	\$213,551	\$305,096	\$463,096	\$609,057
Gross revenue per \$1 expense	\$1.12	\$1.20	\$1.13	\$1.14	\$1.02
Gross revenue per \$1 assets	\$0.27	\$0.16	\$0.20	\$0.25	\$0.42
Value of farm production per \$1 assets	\$0.22	\$0.15	\$0.19	\$0.23	\$0.27
Return on assets (ROA)	1.7%	1.1%	1.5%	2.7%	1.5%
Return on equity (ROE)	1.0%	0.7%	0.7%	2.3%	0.2%
Operating profit margin ratio (as % of gross revenue) ^{1/}	7.1%	7.1%	7.3%	10.7%	3.7%
Operating profit margin ratio (as % of value of farm production)	8.1%	7.4%	7.6%	11.5%	5.8%
Average interest rate on debt	4.5%	4.6%	4.9%	4.1%	4.3%

^{1/} (Accrual Net Farm Income + Interest - Unpaid labor) / Gross revenue

High-, Middle-, and Low-profit Farms

Profits vary greatly among farms. In Table 7, farms were ranked by return to management and sorted into three groups. The high third group is the one with the lowest machinery costs per acre and the highest livestock returns per \$100 feed fed, and its average return to management was \$41,200 in 2016. This group also had the lowest net worth per acre farmed across the three groups. The middle third group had the lowest number of acres in crops, the smallest livestock sales and expenses, and the highest share of depreciation expenses in gross revenue, and its return to management averaged -\$59,640. The low third group averaged a return to management of -\$223,020, and farms in that group had the highest number of acres in crops, the highest machinery investment per crop acre, and the highest livestock sales and expenses. However, their net worth per acre is the highest among the three groups.

High-, Middle-, and Low-profit Farms

Table 7. Comparison of High-, Middle-, and Low-profit Farms, Ranked by Return to Management ^{1/}

	High Third	Middle Third	Low Third	Your Farm
Farm Income				
Crop sales	\$428,378	\$370,895	\$550,337	_____
Livestock sales	164,653	80,352	638,305	_____
Other income and inventory	130,096	74,531	14,450	_____
Accrued income	30,114	18,420	105,229	_____
Gross revenue	\$753,241	\$544,197	\$1,308,321	_____
Operating expenses	\$269,475	\$227,768	\$439,851	_____
Fixed expenses (incl. depreciation)	224,450	210,643	401,336	_____
Feed purchased	66,350	39,714	278,677	_____
Livestock purchased	56,043	34,230	241,850	_____
Total expenses	\$616,318	\$512,354	\$1,361,715	_____
Accrual Net Farm Income	\$136,923	\$31,844	-\$53,394	_____
Operator and family labor charge	\$29,818	\$28,117	\$33,755	_____
Charge for equity capital	65,905	63,367	135,871	_____
Return to Management	\$41,200	-\$59,640	-\$223,020	_____
Crops				
Acres in crops	702	603	980	_____
Crop value per acre	\$653	\$645	\$669	_____
Crop acres per person	490	495	397	_____
Machinery cost per crop acre	\$116	\$141	\$139	_____
Machinery investment per crop acre	\$405	\$545	\$559	_____
Livestock				
Livestock returns per \$100 feed fed	\$162	\$120	\$110	_____
Value of Farm Production	\$630,848	\$470,254	\$787,793	_____
Financial				
Gross revenue per person	\$525,018	\$446,475	\$530,030	_____
Gross revenue per \$1 expense	\$1.22	\$1.06	\$0.96	_____
Gross revenue per \$1 assets	\$0.37	\$0.29	\$0.31	_____
Value of farm production per \$1 assets	\$0.31	\$0.25	\$0.19	_____
Return on assets (ROA)	6.3%	1.3%	-1.0%	_____
Return on equity (ROE)	7.0%	0.3%	-2.9%	_____
Operating profit margin ratio (as % of gross revenue) ^{1/}	0.17	0.05	-0.03	_____
Operating profit margin ratio (as % of value of farm production)	0.21	0.05	-0.05	_____
Debt-to-asset ratio	0.25	0.25	0.27	_____
Net worth per acre farmed	\$2,175	\$2,374	\$3,106	_____
Allocation of Value of Gross Revenue				
Operating expense	71%	80%	92%	_____
Interest expense	3%	4%	4%	_____
Depreciation expense	8%	10%	9%	_____
Net farm income	18%	6%	-4%	_____

^{1/} Values have not been adjusted for size of business.

Crop Production

Details of crop production income and expenses per acre are summarized in Table 8. Some expenses, such as cash rent, did not occur on all farms or on all acres, but are shown as the average cost over all acres. Total economic costs include a four percent opportunity cost charge for the farm net worth capital, a depreciation charge, and a charge for operator and family labor. The numbers presented in Table 8 refer to simple, unweighted averages across all farms included in the Iowa Farm Business Association Summary Report.

Table 8. Crop Production

	All Corn	Soybeans
Total operator acres per crop*	444	334
Yield, bushels per acre	209	63
Selling price per bushel	\$3.43	\$9.04
Crop value per acre	\$718	\$570
Crop Expenses		
Seed per acre	\$114.11	\$57.16
Fertilizer and lime	135.64	27.52
Herbicide	41.96	43.71
Insecticide	5.34	7.33
Drying and storage	12.99	2.57
Machinery, fuel, repairs, machine hire	73.56	68.95
Utilities	10.03	8.80
Insurance	27.53	26.80
Hired labor	11.74	9.81
Interest	28.39	27.98
Cash rent	129.77	126.72
Property taxes and building repairs	19.69	19.45
Other crop expenses	16.11	14.18
Total cash crop expenses	\$626.86	\$440.99
Machinery depreciation	\$58.60	\$56.38
Building depreciation	16.01	15.13
Charge for equity capital	111.33	111.61
Unpaid labor value	46.10	46.51
Total economic cost per acre	\$858.90	\$670.62
Total economic cost per bushel	\$4.10	\$10.63
Total cash flow needed per acre	\$626.86	\$440.99
Total cash flow needed per bushel	\$2.99	\$6.99

*Operator's share is not available for 2016 data.

Trends

Table 9 illustrates trends in production and financial efficiency over the past 10 years. Livestock income per \$100 feed fed shows a cyclical pattern, but in 2016 it was 16 percent lower than the 10-year average. The average corn yield of 209 was the highest ever, and 17 percent higher than the 10-year average.

The value of farm production per dollar of expense, \$1.12 was the second lowest in the 10-year period, as was the percent return to owned assets at 1.7 percent.

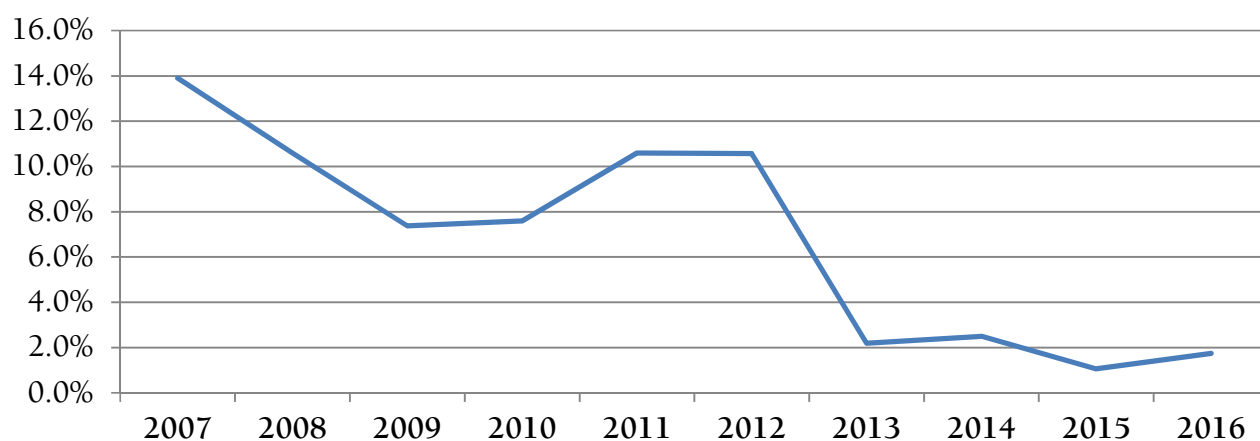
Table 9. Trends in Production and Financial Efficiency on Iowa Farms

Year	Livestock Income per \$100 Feed Fed	Corn Yield Bushels per Acre	Value of Farm Production per \$1 Expense	Crop Value per Acre	Percent Return to Owned Assets
2007	147	171	1.57	576	13.9%
2008	124	179	1.39	541	10.6%
2009	118	183	1.43	562	7.4%
2010	149	174	1.52	584	7.6%
2011	135	172	1.71	671	10.6%
2012 ^{1/}	102	149	1.68	882	10.6%
2013	145	169	1.19	821	2.2%
2014	223	184	1.20	667	2.5%
2015 ^{2/}	133	200	1.09	588	1.1%
2016	117	209	1.12	635	1.7%
10-year average	\$139	179	\$1.39	\$653	6.8%

^{1/} Revised using weights from the 2012 Census of Agriculture.

^{2/} Revised with additional farm data.

Percent Return to Owned Assets



... and justice for all

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Prepared by Alejandro Plastina
extension economist,
plastina@iastate.edu
Ann Johanns
extension program specialist