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# Organic Crop Production

## Enterprise Budgets

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*Ag Decision Maker*

File A1-18

An enterprise budget is an estimate of the costs and returns to produce a product (enterprise). For example, a conventional Iowa corn and soybean producer would be interested in developing both a corn and soybean enterprise budget. Organic growers may have three to six different products they wish to develop budgets for depending upon the number of crops within their rotation. These budgets reflect a four-year rotation of corn, soybeans, oats with alfalfa, and a second year of alfalfa as the crops. Changing the rotation to include a second year of corn after soybeans for example would affect the corn budget described here.

Why use enterprise budgets? In economic terms, enterprise budgets help to allocate land, labor, and capital, which are limited, to the most appropriate use. The most appropriate use is defined by the person in control of the resources and may be used to maximize profits, minimize soil loss, or to achieve other goals.

The estimated costs and returns illustrated are based on a long-term study located at an Iowa State University research farm in southwestern Iowa. The data was modified to more accurately reflect average Iowa results as indicated by organic farmers who reviewed the budgets.

### Budget Format

Enterprise budget formats vary. Some are complex. Others are quite simple. The budgets included in this publication are divided into five sections. They are:

**Receipts.** The first section illustrates the total receipts the enterprise provides on a set unit(s). Records should be kept on both a sales unit (per bushel or per ton) and land unit (per acre) basis. Sales prices are those listed by the Agricultural Marketing Service ([www.ams.usda.gov/mnreports/nw\\_gr113.txt](http://www.ams.usda.gov/mnreports/nw_gr113.txt)) whereas yields are those that would have been received by a wide range of organic

producers over the last two to three years. Note that the alfalfa price for the establishment year is lower than the second year due to lower quality from straw residue being picked up in the fall hay cutting.

**Preharvest.** The second section includes the costs of planting and growing the product (preharvest costs). For example, once the seed is planted or a field operation is completed, the cost has occurred and needs to be covered from some source. Additionally, there is a time delay between preharvest expenses and the time the product is sold. These expenses may have to be covered from borrowing, savings, or some other source. Therefore, interest on preharvest costs should be included as a production expense. Preharvest costs for the oat and alfalfa budgets are referred to as establishment costs and are divided equally between the two crops (years). Dividing establishment costs allocates the first year costs of field preparation and seeds over the life of the establishment which, in this case, is two years. The allocation process is similar to that conducted for [Estimated Costs of Crop Production in Iowa](#) (FM 1712)\* and [Estimated Costs of Pasture and Hay Production](#) (AG 96)\*.

Note that machinery has both a variable and fixed component. The machinery cost estimates for field operations were taken from [Estimated Costs of Crop Production in Iowa](#) (FM 1712). Field operations listed are those typically conducted by organic producers. Seed costs are average prices paid. Supplemental fertility can be supplied by a number of products ranging from liquid swine manure to bedded compost from dairy, poultry, or other livestock production systems. The costs of the products vary substantially based on availability, distance from farm, and fertility content.

\* See note at the end of this publication for ordering information.

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This corn budget assumes that manure is readily available from a nearby livestock producer and provides enough nitrogen, given the rotation used. The application of the manure is included in the listing of field operations and the purchase price for the manure is listed under fertilizer. The amount of P and K needed for the entire four year rotation will depend upon crop yields (removal rates) as well as the fertility content and application rate of the manure.

Miscellaneous expenses vary and include those cost items that are related to the general production practices for the crop but are either infrequent (not annual) or don't quite fit into the other cost categories. For organic crops, miscellaneous expenses may include costs related to organic certification.

**Harvest.** The third section is the harvest component. Handling and hauling costs are included with the harvesting activity and machinery has a variable and fixed component. Again, the machinery cost estimates were taken from [Estimated Costs of Crop Production in Iowa](#) (FM 1712).

**Labor and Land.** The fourth section relates to labor and land ownership costs. Labor is considered a fixed cost in these budgets because most labor is provided by the operator, family, or permanent hired labor. The hours per acre are those typically provided for fieldwork for each crop. The soybean budget includes two hours of hand weeding in addition to the 1.1 hours per acre for pre-harvest and harvest machinery. No labor was added for traveling to and from the field, repairs, or other activities related to production. These activities would add approximately 1.5 hours per acre to the fieldwork times listed in the budgets. The land use is charged a cash rent equivalent of \$266 per acre. This charge reflects ownership costs and a return to the land asset regardless of whether the land is actually owned or rented. Depending upon the debt level and interest rate, principal and interest payments for purchased land could be higher than the cash rent equivalent listed.

**Summary of Returns.** The last section is the summary of returns. The total costs are variable costs and ownership costs combined. The return over variable costs is total receipts minus total variable costs. The return over all costs is total receipts minus combined variable and ownership costs. Return to Management is the economic return over total costs. This is the amount left over to cover family living expenses, savings, future investments, etc.

### Limitations

The illustrated budgets are to be used as an indication of what a particular crop could average over time and location. Individual farm results will vary from these numbers based on soil types, location to markets, availability to manure sources, and managerial ability, among other considerations.

The budgets include receipts as well as costs through harvest and handling. Marketing costs have been excluded. Note that prices listed from the Agricultural Marketing Service (AMS) are F.O.B. the farm indicating the buyer of the crop will pay for transportation from the farm to their selected destination. Prices represent typical prices reported throughout the year by AMS but are not indicative of the season average price received. Alfalfa prices reflect prices received by farmers at Iowa hay auctions for premium alfalfa. Transportation costs to market are not included. Oat straw is estimated to be 65 percent of alfalfa price to reflect differences in feed value.

\* [Estimated Costs of Crop Production in Iowa](#) (FM 1712), [Estimated Costs of Pasture and Hay Production](#) (AG 96), [Using Manure Nutrients for Crop Production](#) (PMR 1003), and [A General Guide for Crop Nutrient and Limestone Recommendations in Iowa](#) (PM 1688) are available for download from the Extension Store at <http://store.extension.iastate.edu>.

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## Organic Corn Budget

	Quantity	\$/Unit	Total	Your Estimate
<b>Receipts</b>				
Organic corn sales	165 bu	\$10.50	\$1,732.50	_____
		<b>Fixed Cost</b>	<b>Variable Cost</b>	
<b>Preharvest</b>				
Plow (moldboard)		\$9.00	\$8.50	_____
Tandem disk		3.80	2.60	_____
Inject liquid swine manure		5.10	5.00	_____
Field cultivate		2.70	2.40	_____
Plant		6.20	4.90	_____
Rotary hoe (2x)		3.60	2.00	_____
Row cultivate (2x)		<u>5.20</u>	<u>4.20</u>	_____
<b>Total Machinery Costs</b>		<b>\$35.60</b>	<b>\$29.60</b>	_____
Seed (price per 1,000 seeds)	32,200	\$2.50	\$80.50	_____
Fertilization (liquid swine manure)	2,500	\$0.02	50.00	_____
Crop insurance			13.60	_____
Misc. expenses			10.00	_____
Interest on preharvest variable cost (8 months @ 5.15%)			6.31	_____
<b>Harvest</b>				
Combine		\$19.90	\$9.10	_____
Haul		7.10	4.95	_____
Dry		8.25	31.35	_____
Handle		<u>2.81</u>	<u>2.81</u>	_____
<b>Total Harvest Costs</b>		<b>\$38.05</b>	<b>\$48.21</b>	_____
Labor (hours per acre)	1.4	\$13.00	\$18.20	_____
Land (cash rent equivalent)			\$266.00	_____
<b>Total costs</b>		<b>\$357.85</b>	<b>\$238.21</b>	_____
<b>Total costs per bushel</b>		<b>\$2.17</b>	<b>\$1.44</b>	_____
Returns over variable cost			\$1,494.29	_____
Returns over total cost			\$1,136.44	_____
Return to land, labor, and management			\$1,420.64	_____
Return to land and management			\$1,402.44	_____
Return to management			\$1,136.44	_____

# Organic Soybean Budget

	Quantity		\$/Unit	Total	Your Estimate
<b>Receipts</b>					
Organic soybean sales (cleaned)	36	bu	\$26.00	\$936.00	_____
Organic soybean sales (screened)	4	bu	\$22.00	\$88.00	_____
<b>Total Receipts</b>	<b>40</b>			<b>\$1,024.00</b>	_____
			<b>Fixed Cost</b>	<b>Variable Cost</b>	
<b>Preharvest</b>					
Fall - disk stalks			\$3.80	\$2.60	_____
Fall - plant rye			2.90	1.50	_____
Disk rye (2x)			5.20	4.60	_____
Field cultivate			2.70	2.40	_____
Plant			6.20	4.90	_____
Rotary hoe (2x)			3.60	2.00	_____
Row cultivate (2x)			5.20	4.60	_____
<b>Total Machinery Costs</b>			<b>\$29.60</b>	<b>\$22.60</b>	_____
Soybean seed (price per bushel)	1.5	\$32.70		\$49.05	_____
Rye seed (price per bushel)	0.4	\$13.44		5.38	_____
Crop insurance				8.90	_____
Misc. expenses				11.00	_____
Interest on preharvest variable costs (8 months @ 5.15%)				3.33	_____
<b>Harvest</b>					
Combine			\$15.90	\$6.80	_____
Haul			1.64	1.52	_____
Handle			0.68	0.68	_____
<b>Total Harvest Costs</b>			<b>\$18.22</b>	<b>\$9.00</b>	_____
Labor (hours per acre)	3.1	\$13.00	\$40.30		_____
Land (cash rent equivalent)			\$266.00		_____
<b>Total costs</b>			<b>\$354.12</b>	<b>\$109.25</b>	_____
<b>Total costs per bushel</b>			<b>\$8.85</b>	<b>\$2.73</b>	_____
<b>Returns over variable costs</b>				<b>\$914.75</b>	_____
<b>Returns over total costs</b>				<b>\$560.63</b>	_____
<b>Return to land, labor, and management</b>				<b>\$866.93</b>	_____
<b>Return to land and management</b>				<b>\$826.63</b>	_____
<b>Return to management</b>				<b>\$560.63</b>	_____

## Organic Oat/Alfalfa Budget

	Quantity	\$/Unit	Total	Your Estimate
<b>Receipts</b>				
Organic oat sales	80 bu	\$4.50	\$360.00	_____
Straw sales	1.0 ton	\$75.00	\$75.00	_____
Organic alfalfa sales	1.0 ton	\$150.00	\$150.00	_____
<b>Total Receipts</b>			<b>\$585.00</b>	_____
<b>Establishment</b>				
		<b>Fixed Cost</b>	<b>Variable Cost</b>	
Field cultivate		\$2.60	\$2.30	_____
Harrow		2.00	1.30	_____
Drill oats		4.40	3.70	_____
Cultipack		2.60	2.10	_____
<b>Total Machinery Costs</b>		<b>\$11.60</b>	<b>\$9.40</b>	_____
Oat seed (unit price per bushel)	2.5	\$12.90	\$32.25	_____
Alfalfa mix (unit price per pound)	16.0	\$4.65	74.40	_____
Crop insurance			0.00	_____
Misc. expenses			10.00	_____
Interest on preharvest variable cost (6 months @ 5.15%)			\$3.25	_____
<b>One half of establishment costs</b>		\$5.80	\$64.65	_____
<b>Harvest</b>				
Combined		\$11.70	\$4.30	_____
Haul oats		3.44	2.40	_____
Handle oats		1.36	1.36	_____
Baled oat straw (small squares)		11.50	7.00	_____
Haul oat straw		1.87	2.47	_____
Mowed alfalfa mix		6.20	3.60	_____
Raked alfalfa mix		3.50	2.10	_____
Baled alfalfa mix (large squares)		11.50	7.00	_____
Haul alfalfa mix		1.87	2.47	_____
<b>Total Harvest Costs</b>		<b>\$52.94</b>	<b>\$32.70</b>	_____
Labor (hours per acre)	1.2	\$13.00	\$15.60	_____
Land (cash rent equivalent)			\$266.00	_____
<b>Total costs</b>		<b>\$340.34</b>	<b>\$97.35</b>	_____
<b>Returns over variable cost</b>			<b>\$487.65</b>	_____
<b>Returns over total cost</b>			<b>\$147.31</b>	_____
<b>Return to land, labor, and management</b>			<b>\$428.91</b>	_____
<b>Return to land and management</b>			<b>\$413.31</b>	_____
<b>Return to management</b>			<b>\$147.31</b>	_____

# Organic Alfalfa Budget

	Quantity		\$/Unit	Total	Your Estimate
<b>Receipts</b>					
Organic alfalfa sales	4.5	tons	\$150.00	\$675.00	_____
			<b>Fixed Cost</b>	<b>Variable Cost</b>	
<b>Preharvest</b>					
One half of establishment costs			\$5.80	\$64.65	_____
Crop insurance				0.00	_____
Misc. expenses				10.00	_____
Interest on preharvest variable costs (6 months @ 5.15%)				1.92	_____
<b>Harvest</b>					
Mowed (3x)			\$16.20	\$11.40	_____
Raked (3x)			10.50	6.30	_____
Baled (3x) - large square			34.50	21.00	_____
Haul (3x)			8.42	11.12	_____
<b>Total Harvest Costs</b>			<b>\$69.62</b>	<b>\$49.82</b>	_____
Labor (hours per acre)	1.5	\$13.00	\$19.50		_____
Land (cash rent equivalent)			\$266.00		_____
<b>Total costs</b>			<b>\$360.92</b>	<b>\$126.39</b>	_____
<b>Returns over variable cost</b>				<b>\$548.61</b>	_____
<b>Returns over total cost</b>				<b>\$187.70</b>	_____
<b>Return to land, labor, and management</b>				<b>\$473.20</b>	_____
<b>Return to land and management</b>				<b>\$453.70</b>	_____
<b>Return to management</b>				<b>\$187.70</b>	_____

## Estimated Organic Crop Production Costs in Iowa, 2008-2016<sup>1/</sup>

	2008	2009	2010	2011 <sup>2/</sup>	2012	2013	2014	2015	2016
<b>Corn</b>									
Machinery	\$129.35	\$125.55	\$127.05	\$165.02	\$160.39	\$160.39	\$169.92	\$158.11	\$151.46
Seed, Chemicals, etc.	124.28	170.96	173.81	141.32	163.37	169.64	171.30	160.40	160.41
Labor	15.40	15.40	15.40	16.24	16.38	17.15	18.20	18.20	18.20
Land	225.00	232.00	222.00	245.00	294.00	315.00	328.00	273.00	266.00
Total Cost Per Acre	494.03	543.91	538.26	567.58	634.14	662.18	687.42	609.71	596.06
Assumed Yield	150 bu	150 bu	150 bu	165 bu	165 bu	165 bu	165 bu	165 bu	165 bu
Total Cost Per Bushel	\$3.29	\$3.63	\$3.59	\$3.44	\$3.84	\$4.01	\$4.17	\$3.70	\$3.61
Return to Management	\$893.47	\$581.09	\$391.74	\$1,247.42	\$1,840.86	\$1,235.32	\$1,457.58	\$1,122.80	\$1,136.44
<b>Soybeans</b>									
Machinery	\$70.11	\$69.21	\$70.79	\$79.43	\$86.92	\$86.92	\$90.24	\$85.66	\$79.42
Seed, Chemicals, etc.	63.22	85.51	91.12	78.81	88.86	92.65	102.37	77.70	77.65
Labor	34.10	34.10	34.10	35.96	36.27	37.98	40.30	40.30	40.30
Land	225.00	232.00	222.00	245.00	294.00	315.00	328.00	273.00	266.00
Total Cost Per Acre	392.43	420.83	418.01	439.20	506.05	532.55	560.91	476.66	463.37
Assumed Yield	40 bu	40 bu	40 bu	40 bu	40 bu	40 bu	40 bu	40 bu	40 bu
Total Cost Per Bushel	\$9.81	\$10.52	\$10.45	\$10.98	\$12.65	\$13.31	\$14.02	\$11.92	\$11.58
Return to Management	\$543.57	\$443.17	\$349.99	\$392.80	\$597.95	\$591.45	\$615.09	\$547.34	\$560.63
<b>Oats/Alfalfa</b>									
One-Half of Est. Costs	\$55.27	\$57.94	\$62.25	\$62.78	\$69.23	\$71.31	\$74.61	\$71.18	\$70.45
Harvest Machinery	57.16	60.36	64.66	85.10	92.96	92.96	95.30	90.94	85.64
Labor	13.20	13.20	13.20	13.92	14.04	14.70	15.60	15.60	15.60
Land	225.00	232.00	222.00	245.00	294.00	315.00	328.00	273.00	266.00
Total Cost Per Acre	350.63	363.50	362.11	406.80	470.23	493.97	513.51	450.72	437.69
Assumed Yield	80 bu	80 bu	80 bu	80 bu	80 bu	80 bu	80 bu	80 bu	80 bu
Total Cost Per Bushel	\$4.38	\$4.54	\$4.53	\$5.09	\$5.88	\$6.17	\$6.42	\$5.63	\$5.47
Return to Management	\$274.37	\$176.50	\$87.89	\$352.40	\$571.77	\$354.83	\$245.29	\$134.28	\$147.31
<b>Alfalfa Hay, annual production, large round bales</b>									
One-Half of Est. Costs	\$55.27	\$57.94	\$62.25	\$62.78	\$69.23	\$71.31	\$74.61	\$71.18	\$70.45
Preharvest Costs	8.32	8.25	8.26	12.02	12.10	12.01	11.96	11.89	11.92
Harvest Machinery	71.30	76.00	78.70	119.70	118.88	118.88	134.70	125.67	119.43
Labor	16.50	16.50	16.50	17.40	17.55	18.38	19.50	19.50	19.50
Land	225.00	232.00	222.00	245.00	294.00	315.00	328.00	273.00	266.00
Total Cost Per Acre	376.39	390.69	387.71	456.90	511.76	535.57	568.77	501.25	487.30
Assumed Yield	4 ton	4 ton	4 ton	4.5 ton	4.5 ton	4.5 ton	4.5 ton	4.5 ton	4.5 ton
Total Cost Per Ton	\$94.10	\$97.67	\$96.93	\$101.53	\$113.72	\$119.01	\$126.39	\$111.39	\$108.29
Return to Management	\$263.61	\$169.31	\$172.29	\$353.10	\$613.24	\$454.43	\$196.23	\$173.82	\$187.70

<sup>1/</sup> Input costs come from annual updates of Extension Publication FM 1712, Estimated Costs of Crop Production.

<sup>2/</sup> Yield assumptions were adjusted starting in 2011.

### ... and justice for all

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