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# 1992 Estimated Grain Crop Production Costs and Returns for Indiana

Howard Doster

Craig L. Dobbins

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**1992 Estimated Grain Crop  
Production Costs and  
Returns for Indiana**

**Purdue University Cooperative Extension Service, West Lafayette, IN 47907**

**1992 ESTIMATED GRAIN CROP PRODUCTION COSTS  
AND RETURNS FOR INDIANA**

Prepared by:

D. Howard Doster

Craig L. Dobbins

Department of Agricultural Economics  
Purdue University

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## 1992 Estimated Grain Crop Production Costs and Returns for Indiana<sup>1</sup>

The attached budgets provide direct cost and return estimates for corn, soybeans, and wheat. They are intended to serve as guides for enterprise selection and contain only the direct costs of production (e.g. fertilizers, chemicals, and machinery operations). These budget estimates should be adjusted using farm records to reflect each individual farm situation before using them for planning purposes.

The return reported in each budget represents the return received for using labor, land, and machinery resources in the production of a particular enterprise. Because the expenses of owning these items will be incurred regardless of the crop produced, the overhead or indirect expenses (e.g. labor and management, land charges, machinery depreciation, and opportunity interest charges) have not been included. This should not imply that these expenses are not important, since in the long-run, revenues must be sufficient to pay indirect expenses if the business is to remain economically viable.

The yields used in each budget assume normal yields with average management for three different soils representing low, average, and high productivity. Eroded Miami, Crosby, and Brookston soils are representative of the low, average, and high productivity soils, respectively. The soil organic matter is assumed to be 1.5%, 1.5%, and 3.0%, respectively.

Rotation corn yields are based on data from AY-212, "Indiana Soils and Their Properties." The Crosby rotation corn yield of 119 was increased to 122 to better represent expected Indiana state average yields. Other yields are estimated as a percent of the rotation corn yield using data from ID-152, "Influence of Production Practices on Yield Estimates for Corn, Soybeans and Wheat".

A machinery compliment adequate to allow the timely planting and harvest of all crops is assumed. The soybean double crop yield is based on a July 1 planting date. The tillage system is assumed to be a conventional system using a moldboard plow for primary tillage. Herbicides are broadcast applied prior to planting. Six-row planting and harvesting equipment is assumed. Corn and soybean crops are cultivated once.

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<sup>1</sup> The able assistance of David Mengel, Stephen Hawkins, and Ellsworth Christmas, Department of Agronomy, Purdue University, in developing these budget estimates is gratefully acknowledged. Their willingness to assist with this effort helped to make the task of developing these estimates much easier. Any remaining errors are the responsibility of the authors.

Fertilizer applications are estimated from Purdue soil test recommendations and are based on maintaining the present fertility level (no buildup). It is assumed that soils currently have high tests for phosphate and potash. Lime amounts represent the pounds of standard ag lime needed to neutralize the acidity from nitrogen. The relationships used to estimate corn, soybean, and wheat fertilizer requirements are as follows:

### Corn Fertilizer

Total Nitrogen (lbs/acre) = (1.8 X yield)  
 - (0.30 X previous corn yield, or 1.35 X previous bean yield)  
 - (20 X percent soil organic matter)

Total Phosphate (lbs/acre) = 0.3 X yield

Total Potash (lbs/acre) = 25 + (0.25 X yield)

Lime (lbs/acre) = 3 X total pounds of nitrogen

### Soybean Fertilizer

Total Phosphate (lbs/acre) = 0.75 X yield

Total Potash (lbs/acre) = 25 + (1.25 X yield)

### Wheat Fertilizer

Total Nitrogen (lbs/acre) = 15 + (1.0 X yield)

Total Phosphate (lbs/acre) = 0.5 X yield

Total Potash (lbs/acre) = 25 + (0.25 X yield)

Lime (lbs/acre) = 3 X total pounds of nitrogen

While the phosphate and potash fertilizer for rotation soybeans and double crop soybeans may be applied with the fertilizer of the proceeding crop, their costs have been prorated in each budget to provide a more accurate accounting of enterprise costs.

Machinery fuel costs include that used in the field plus an additional 25 percent to cover miscellaneous operations such as moving between fields and lubricant expenses. The fuel utilized in the field is based on estimates from AE-110, "Energy Management in Agriculture"

and NCR-202, "Energy Requirements For Various Tillage-Planting Systems." The machinery fuel expense is calculated as gallons per acre X price per gallon X 1.25.

Drying and handling charges are based on the removal of 10 points of moisture for continuous corn and 7 points of moisture for rotation corn. A lower moisture removal was used for rotation corn in order to represent the greater amount of field drying that can be achieved when corn is grown in rotation with soybeans. It is assumed that 55 points of moisture can be removed with each gallon of fuel. Fuel costs of \$0.40 per gallon were used. A charge of \$0.02 per bushel is made to cover the cost of grain handling. When producing double crop soybeans, wheat is assumed to be dried in order to allow earlier wheat harvest and soybean planting.

Crop insurance costs assume the crop is insured at the 65 percent yield level and the medium price level. (Corn = \$2.00 per bushel, soybeans = \$5.50 per bushel, wheat = \$2.85 per bushel.)

For corn, full-season soybeans, and wheat, interest is charged on fertilizer and lime, seed, herbicides, and insecticides for 9 months. This is to reflect the booking and payment for these inputs in January. Interest on one-half the machinery fuel and repairs and miscellaneous expenses is charged for 6 months. For interest charges, the dollar value in the quantity column reflects the 9 and 6 month adjustments. For example, the quantity used for the interest charge for rotation corn on average productivity soil is computed as follows:

Total fertilizer & lime	\$35.75	
+ Seed	20.25	
+ Chemicals	21.08	
	<u>77.08</u>	$\times 9 \div 12 = \$57.81$
1/2 machinery fuel and repairs	\$13.33	
Miscellaneous	5.00	
	<u>18.33</u>	$\times 6 \div 12 = \$ 9.16$
		<u>\$66.97</u>

The corn and wheat budgets contain estimates of the additional return associated with participation in commodity price support programs. These estimates are provided for completeness and will vary with each individual situation. To better estimate the return from program participation and its impact on the selection of crops, the user of these budget estimates is encouraged to use the spreadsheet program "1992 Crop Program Analysis." This computer program is available from your local county extension office and requires an IBM or IBM compatible microcomputer with 640K of RAM memory.

Costs included in set aside production assume an annual crop such as oats is planted. The total cost of planting and maintaining this cover crop were estimated to be \$13.77 per acre. The ASCS yield for corn on low, average, and high productivity soils were assumed to be 91,

113, and 140 bushels per acre, respectively. Deficiency payments are assumed to be \$0.40 per bushel. The deficiency payment reflects adjustments for a 5 percent set aside requirement and a 15 percent reduction for flexible acreage, so are multiplied by 80 percent of the corn base. The deficiency payment for rotation corn on average productivity land would be calculated as follows:

$$\begin{array}{rcl} 113 \times \$0.40 \times .8 & = & \$36.16 \\ \text{less } 5\% \times \$13.77 & = & \underline{0.69} \\ & & \$35.47 \end{array}$$

For wheat production, the deficiency payment yield for low, average, and high productivity soils was assumed an ASCS yield of 54, 61, and 68 bushels per acre for the low, average, and high productivity soils, respectively. A wheat deficiency payment of \$1.00 per bushel was assumed. The adjustments for a 5 percent set aside requirement and a 15 percent reduction for flexible acreage was also made when estimating the wheat deficiency payment.

Table 1. Continuous corn for low, average and high productivity soils.

	Unit	Price per unit	Low productivity soil		Average productivity soil		High productivity soil	
			Quantity	Value per acre	Quantity	Value per acre	Quantity	Value per acre
<b>PRODUCTION AND REVENUE</b>								
Corn grain	bu.	\$2.40	91.0	\$218.40	113.0	\$271.20	140.0	\$336.00
<b>DIRECT CHARGES</b>								
Nitrogen (Anhydrous)	lb.	\$0.13	102.0	\$13.26	135.0	\$17.55	145.0	\$18.85
Phosphate	lb.	\$0.22	10.0	2.20	17.0	3.74	25.0	5.50
Potash	lb.	\$0.12	48.0	5.76	53.0	6.36	60.0	7.20
10-34-0 Starter	lb.	\$0.10	50.0	5.00	50.0	5.00	50.0	5.00
Lime	lb.	\$0.006	321.0	1.93	420.0	2.52	450.0	2.70
Total fertilizer & lime				\$28.15		\$35.17		\$39.25
Seed (80,000 seed/bag)	bag	\$62.00	0.30	\$18.60	0.00	\$0.00	0.00	\$0.00
Seed (80,000 seed/bag)	bag	\$67.50	0.0	0.00	0.30	20.25	0.34	22.95
Atrazine	qt.	\$2.48	1.5	\$3.72	1.67	\$4.14	2.0	\$4.96
2-4D	pt.	\$1.95	0.25	0.49	0.25	0.49	0.25	0.49
Dual	qt.	13.80	1.0	13.80	1.0	13.80	1.0	13.80
Counter	lb.	\$1.55	8.7	13.49	8.7	13.49	8.7	13.49
Total Chemicals				\$31.50		\$31.92		\$32.74
Machinery fuel	gal.	\$0.82	7.7	\$7.89	8.8	\$9.02	10.0	\$10.25
Drying & handling	bu.	\$0.093	91.0	\$8.46	113.0	\$10.51	140.0	\$13.02
Machinery repairs	acre	\$1.00	16.54	\$16.54	17.64	\$17.64	18.74	\$18.74
Crop insurance	acre	\$1.00	3.67	\$3.67	3.38	\$3.38	3.46	\$3.46
Miscellaneous	acre	\$1.00	5.0	\$5.00	5.0	\$5.00	5.0	\$5.00
Interest on direct charges	acre	10.0%	\$67.29	\$6.73	\$74.66	\$7.47	\$80.95	\$8.10
Total direct charges				\$126.54		\$140.36		\$153.51
<b>SUMMARY</b>								
Excluding deficiency payments:								
Revenue less direct charges				\$91.86		\$130.84		\$182.49
Direct charges per bushel				\$1.39		\$1.24		\$1.10
Including deficiency payments (per acre of base):								
Crop revenue less direct charges				\$87.27		\$124.30		\$173.37
Deficiency payments less set aside production costs				28.43		35.47		44.11
Total revenue less direct charges				\$115.70		\$159.77		\$217.48

Table 2. Rotation corn for low, average and high productivity soils.

	Unit	Price per unit	Low productivity soil		Average productivity soil		High productivity soil	
			Quantity	Value per acre	Quantity	Value per acre	Quantity	Value per acre
<b>PRODUCTION AND REVENUE</b>								
Corn grain	bu.	\$2.40	98.0	\$235.20	122.0	\$292.80	150.0	\$360.00
<b>DIRECT CHARGES</b>								
Nitrogen (Anhydrous)	lb.	\$0.13	100.0	\$13.00	132.0	\$17.16	140.0	\$18.20
Phosphate	lb.	\$0.22	12.0	2.64	20.0	4.40	28.0	6.16
Potash	lb.	\$0.12	50.0	6.00	56.0	6.72	63.0	7.56
10-34-0 Starter	lb.	\$0.10	50.0	5.00	50.0	5.00	50.0	5.00
Lime	lb.	\$0.006	315.0	<u>1.89</u>	411.0	<u>2.47</u>	435.0	<u>2.61</u>
Total fertilizer & lime				\$28.53		\$35.75		\$39.53
Seed (80,000 seed/bag)	bag	\$62.00	0.30	\$18.60	0.00	\$0.00	0.00	\$0.00
Seed (80,000 seed/bag)	bag	\$67.50	0.0	0.00	0.30	20.25	0.34	22.95
Atrazine	qt.	\$2.48	0.75	\$1.86	0.85	\$2.11	1.0	\$2.48
2-4D Amine	pt.	\$1.95	0.25	0.49	0.25	0.49	0.25	0.49
Dual	qt.	13.80	1.0	13.80	1.0	13.80	1.0	13.80
Counter	lb.	\$4.68	1.0	<u>4.68</u>	1.0	<u>4.68</u>	1.0	<u>4.68</u>
Total Chemicals				\$20.83		\$21.08		\$21.45
Machinery fuel	gal.	\$0.82	7.7	\$7.89	8.8	\$9.02	10.0	\$10.25
Drying & handling	bu.	\$0.071	98.0	\$6.96	122.0	\$8.66	150.0	\$10.65
Machinery repairs	acre	\$1.00	16.54	\$16.54	17.64	\$17.64	18.74	\$18.74
Crop insurance	acre	\$1.00	3.44	\$3.44	3.17	\$3.17	3.51	\$3.51
Miscellaneous	acre	\$1.00	5.0	\$5.00	5.0	\$5.00	5.0	\$5.00
Interest on direct charges	acre	10.0%	\$59.58	<u>\$5.96</u>	\$66.97	<u>\$6.70</u>	\$72.69	<u>\$7.27</u>
Total direct charges				\$113.75		\$127.27		\$139.35
<b>SUMMARY</b>								
Excluding deficiency payments:								
Revenue less direct charges				\$121.45		\$165.53		\$220.65
Direct charges per bushel				\$1.16		\$1.04		\$0.93
Including deficiency payments (per acre of base):								
Crop revenue less direct charges				\$115.38		\$157.25		\$209.62
Deficiency payments less set aside production costs				28.43		35.47		44.11
Total revenue less direct charges				\$143.81		\$192.72		\$253.73

Table 3. Rotation soybeans for low, average and high productivity soils.

	Unit	Price per unit	Low productivity soil		Average productivity soil		High productivity soil	
			Quantity	Value per acre	Quantity	Value per acre	Quantity	Value per acre
<b>PRODUCTION AND REVENUE</b>								
Soybeans	bu.	\$5.60	31.0	\$173.60	39.0	\$218.40	48.0	\$268.80
<b>DIRECT CHARGES</b>								
Phosphate	lb.	\$0.22	23.0	5.06	29.0	6.38	36.0	7.92
Potash	lb.	\$0.12	64.0	<u>7.68</u>	74.0	<u>8.88</u>	85.0	<u>10.20</u>
Total fertilizer & lime				\$12.74		\$15.26		\$18.12
Seed	bu.	\$9.50	0.83	\$7.89	0.00	\$0.00	0.00	\$0.00
Seed	bu.	\$13.00	0.0	0.00	0.83	10.79	1.00	13.00
Dual	qt.	13.80	1.0	13.80	1.0	13.80	1.0	13.80
Lorox Plus	lb.	\$14.92	0.87	<u>12.98</u>	0.94	<u>14.02</u>	1.0	<u>14.92</u>
Total Chemicals				\$26.78		\$27.82		\$28.72
Machinery fuel	gal.	\$0.82	7.7	\$7.89	8.8	\$9.02	10.0	\$10.25
Machinery repairs	acre	\$1.00	12.13	\$12.13	13.23	\$13.23	14.33	\$14.33
Crop insurance	acre	\$1.00	3.99	\$3.99	4.04	\$4.04	3.78	\$3.78
Miscellaneous	acre	\$1.00	5.0	\$5.00	5.0	\$5.00	5.0	\$5.00
Interest on direct charges	acre	10.0%	\$43.06	<u>\$4.31</u>	\$48.47	<u>\$4.85</u>	\$53.53	<u>\$5.35</u>
Total direct charges				\$80.73		\$90.01		\$98.55
<b>SUMMARY</b>								
Excluding deficiency payments:								
Revenue less direct charges				\$92.87		\$128.39		\$170.25
Direct charges per bushel				\$2.60		\$2.31		\$2.05

Table 4. Wheat for low, average and high productivity soils.

	Unit	Price per unit	Low productivity soil		Average productivity soil		High productivity soil	
			Quantity	Value per acre	Quantity	Value per acre	Quantity	Value per acre
<b>PRODUCTION AND REVENUE</b>								
Wheat grain	bu.	\$3.00	54.0	\$162.00	61.0	\$183.00	68.0	\$204.00
<b>DIRECT CHARGES</b>								
Nitrogen (Urea)	lb.	\$0.22	69.0	\$15.18	76.0	\$16.72	83.0	\$18.26
Phosphate	lb.	\$0.22	27.0	5.94	31.0	6.82	34.0	7.48
Potash	lb.	\$0.12	39.0	4.68	40.0	4.80	42.0	5.04
Lime	lb.	\$0.006	207.0	<u>1.24</u>	228.0	<u>1.37</u>	249.0	<u>1.49</u>
Total fertilizer & lime				\$27.04		\$29.71		\$32.27
Seed	bu.	\$4.00	2.0	\$8.00	0.00	\$0.00	0.00	\$0.00
Seed	bu.	\$6.50	0.0	0.00	2.00	13.00	2.00	13.00
Machinery fuel	gal.	\$0.82	3.5	\$3.59	3.5	\$3.59	3.5	\$3.59
Machinery repairs	acre	\$1.00	11.55	\$11.55	12.60	\$12.60	13.13	\$13.13
Crop insurance	acre	\$1.00	2.60	\$2.60	2.26	\$2.26	1.94	\$1.94
Miscellaneous	acre	\$1.00	3.0	\$3.00	3.0	\$3.00	3.0	\$3.00
Interest on direct charges	acre	10.0%	\$31.57	\$3.16	\$37.58	\$3.76	\$39.63	\$3.96
Total direct charges				\$58.94		\$67.92		\$70.89
<b>SUMMARY</b>								
Excluding deficiency payments:								
Revenue less direct charges				\$103.06		\$115.08		\$133.11
Direct charges per bushel				\$1.09		\$1.11		\$1.04
Including deficiency payments (per acre of base):								
Crop revenue less direct charges				\$97.91		\$109.33		\$126.45
Deficiency payments less set aside production costs				42.51		48.11		53.71
Total revenue less direct charges				\$140.42		\$157.44		\$180.16

Table 5. Double-crop soybeans for low, average and high productivity soils.

	Unit	Price per unit	Low productivity soil		Average productivity soil		High productivity soil	
			Quantity	Value per acre	Quantity	Value per acre	Quantity	Value per acre
<b>PRODUCTION AND REVENUE</b>								
Soybeans	bu.	\$5.60	19.0	\$106.40	23.0	\$128.80	29.0	\$162.40
<b>DIRECT CHARGES</b>								
Phosphate	lb.	\$0.22	14.0	3.08	17.0	3.74	22.0	4.84
Potash	lb.	\$0.12	24.0	2.88	29.0	3.48	36.0	4.32
Total fertilizer & lime				\$5.96		\$7.22		\$9.16
Seed	bu.	\$9.50	1.78	\$16.91	1.78	\$16.91	1.78	\$16.91
Gramoxone	pt.	\$3.36	2.25	7.56	2.25	7.56	2.25	7.56
Dual	qt.	13.80	1.0	13.80	1.0	13.80	1.0	13.80
Lorox Plus	lb.	\$14.92	0.87	12.98	0.94	14.02	1.0	14.92
Total Chemicals				\$34.34		\$35.38		\$36.28
Machinery fuel	gal.	\$0.82	3.0	\$3.08	3.0	\$3.08	3.0	\$3.08
Drying & handling	bu.	\$0.035	54.0	\$1.89	61.0	\$2.14	68.0	\$2.38
Machinery repairs	acre	\$1.00	7.35	\$7.35	8.40	\$8.40	8.95	\$8.95
Crop insurance	acre	\$1.00	0	\$0.00	0	\$0.00	0	\$0.00
Miscellaneous	acre	\$1.00	4.0	\$4.00	4.0	\$4.00	4.0	\$4.00
Interest on direct charges	acre	10.0%	\$47.51	4.75	\$49.50	4.95	\$51.77	5.18
Total direct charges				\$78.28		\$82.08		\$85.94
<b>SUMMARY</b>								
Excluding deficiency payments:								
Revenue less direct charges				\$28.12		\$46.72		\$76.46
Direct charges per bushel				\$4.12		\$3.57		\$2.96

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