

2016 Purdue Crop Cost & Return Guide

January 2016 Estimates

Both product prices and input prices may have significantly changed since these estimates were prepared.

Table 1. Estimated per Acre Crop Budgets for Low, Average, and High Productivity Indiana Soils

	Crop Budgets for Three Yield Levels ¹														
	Low Productivity Soil					Average Productivity Soil					High Productivity Soil				
	Cont. Corn	Rot. Corn	Rot. Beans	Wheat	DC Beans	Cont. Corn	Rot. Corn	Rot. Beans	Wheat	DC Beans	Cont. Corn	Rot. Corn	Rot. Beans	Wheat	DC Beans
Expected yield per acre ²	124	132	40	57	28	155	165	50	71	35	186	198	60	85	42
Harvest price ³	\$3.50	\$3.50	\$8.40	\$4.50	\$8.40	\$3.50	\$3.50	\$8.40	\$4.50	\$8.40	\$3.50	\$3.50	\$8.40	\$4.50	\$8.40
Market revenue	\$434	\$462	\$336	\$257	\$235	\$543	\$578	\$420	\$320	\$294	\$651	\$693	\$504	\$383	\$353
Less variable costs ⁴															
Fertilizer ⁵	\$123	\$110	\$38	\$51	\$28	\$131	\$118	\$46	\$67	\$34	\$138	\$126	\$54	\$83	\$40
Seed ⁶	100	100	74	44	85	123	123	74	44	85	123	123	74	44	85
Pesticides ⁷	42	42	26	12	25	42	42	26	12	25	42	42	26	12	25
Dryer fuel ⁸	23	19	N/A	N/A	3	29	23	N/A	N/A	4	35	28	N/A	N/A	5
Machinery fuel @ \$1.68	12	12	8	8	5	12	12	8	8	5	12	12	8	8	5
Machinery repairs ⁹	22	22	18	18	15	22	22	18	18	15	22	22	18	18	15
Hauling ¹⁰	12	13	4	6	3	16	17	5	7	4	19	20	6	9	4
Interest ¹¹	10	10	6	4	6	12	11	6	5	6	12	11	6	6	6
Insurance/misc. ¹²	32	33	23	3	4	32	33	23	3	4	32	33	23	3	4
Total variable cost	\$376	\$361	\$197	\$146	\$174	\$419	\$401	\$206	\$164	\$182	\$435	\$417	\$215	\$183	\$189
Contribution margin ¹³ (Revenue - variable costs) per acre	\$58	\$101	\$139	\$111	\$61	\$124	\$177	\$214	\$156	\$112	\$216	\$276	\$289	\$200	\$164

¹Estimated yields and costs are for yields with average management for three different soils representing low, average, and high productivity. The high productivity soils represent soils capable of producing corn and soybeans with yields about 20% higher than average soils. Low productivity soils represent soils capable of producing corn and soybeans with yields about 20% lower than the average soils.

²These yields assume average weather conditions and timely plant/harvest date, except soybean double-crop yield, which is based on a July 1 planting date. Continuous corn, full-season soybean, and wheat yields are a percent of rotation corn yield: continuous corn 94%; rotation soybeans 30%; and wheat 43%. Double-crop soybean yields are 70% of full-season soybean yields. Continuous corn yields assume a chisel plow tillage system. Double-crop soybean yields apply to central and southern Indiana. Rotation corn yields for average soils are based on the long-run trends in state average yields reported by the Indiana office of the National Agricultural Statistics Service.

³Harvest corn price is December 2016 CME Group futures price less \$0.25 basis. Harvest soybean price is November 2016 CME Group futures price less \$0.35 basis. Harvest wheat price is July 2016 CME Group futures price less \$.35 basis. Harvest prices were based on opening prices on January 7, 2016. These prices will change.

Table 1 (Continued)

⁴Input prices for variable costs reflect expected prices for 2016. These prices will vary by location and time of the year. Users need to adjust these prices to reflect their own expectations and price situation.

⁵Phosphate, potash, and lime applications are based on Tri-State Fertilizer Recommendations (Source: Michigan Extension Bulletin E-2567, July 1995). Lime amounts represent the pounds of standard ag lime needed to neutralize the acidity from the nitrogen supplied from sources other than ammonium sulfate. Nitrogen application rate for corn is based on research from the Department of Agronomy, Purdue University. Anhydrous ammonia is used as the nitrogen source for corn. Urea is used as the nitrogen source for wheat. Pounds of N, P₂O₅, K₂O, and lime by crop and soil were as follows: continuous corn, 220-45-53-660, 220-56-61-660, 220-67-69-660; rotation corn, 180-48-55-540, 180-60-63-540, 180-71-72-540; rotation beans, 0-34-80-0, 0-43-96-0, 0-52-111-0; wheat, 58-38-42-172, 84-47-48-251, 110-57-53-330; double crop beans, 0-24-62-0, 0-30-73-0, 0-37-84-0. Fertilizer prices per lb.: NH₃ @ \$0.35; urea @ \$0.40; P₂O₅ @ \$0.45; K₂O @ \$0.31; lime @ \$19.00/ton spread on the field. 5-10% more nitrogen might be needed on poorly drained soils. All soil tests for phosphorus and potassium are assumed to be in the maintenance range, and the pH is in the recommended range.

⁶Corn seed prices assume a biotech variety with multiple traits. A 20%-refuge is planted with varieties that do not contain insect resistant traits, but do include herbicide tolerance. Seeding rates for corn are 27,000 seeds per acre on low productivity soils and 33,000 seeds per acre on average and high productivity soils. Soybean seed prices include Round-Up Ready® varieties. Rotation soybeans are drilled with a seeding rate of 169,000 seeds per acre with a 90% germination rate. Double-crop soybeans are drilled with a seeding rate of 195,000 seeds per acre. The seeding rate for wheat is two bushels per acre.

⁷Includes insecticides and herbicides. For corn, rootworm insecticide is applied to the refuge acres. In some areas of Indiana, this may not be required. These costs do not include the application of fungicide to corn. If fungicide is applied, this will add an additional \$28 to \$32 per acre for material and application. Pesticide costs can vary widely based on herbicides selected, required rate of application, and product pricing.

⁸Fuel used to dry crop to a safe moisture level for storage. For double-crop soybeans, the drying charge represents the drying of wheat in order to allow an earlier planting of soybeans.

⁹Repairs are based on approximately 5-year-old machinery. For older machinery, per acre repairs and downtime cost will be higher.

¹⁰Hauling charge represents moving grain from field to storage.

¹¹Interest is based on 5% annual rate for 9 months for seed, fertilizer, and chemicals, and for 6 months for half the machinery fuel and repairs, and all miscellaneous expenses.

¹²The cost of crop insurance represents the premium estimated for a Revenue Coverage (RP) policy at the 75% level. Estimates were based on rates in 2015. Crop insurance is included in budgets for corn and full-season soybeans, but is not included for wheat and double-crop soybeans.

¹³Contribution margin is the return to labor and management, machinery services, land resources, and risk.

Table 2. Estimated per Acre Government Payments, Overhead Costs & Earnings for Low, Average, and High Productivity Indiana Soils

Farm Acres Rotation ¹	Low Productivity Soil				Average Productivity Soil				High Productivity Soil			
	900 c-c	1000 c-b	2700 c-c	3000 c-b	900 c-c	1000 c-b	2700 c-c	3000 c-b	900 c-c	1000 c-b	2700 c-c	3000 c-b
Crop contribution margin ²	\$58	\$120	\$58	\$120	\$124	\$196	\$124	\$196	\$216	\$283	\$216	\$283
Government payment ³	\$25	\$25	\$25	\$25	\$25	\$25	\$25	\$25	\$25	\$25	\$25	\$25
Total contribution margin	\$83	\$145	\$83	\$145	\$149	\$221	\$149	\$221	\$241	\$308	\$241	\$308
Annual overhead costs:												
Machinery ownership ⁴	\$136	\$122	\$109	\$98	\$136	\$122	\$109	\$98	\$136	\$122	\$109	\$98
Family and hired labor ⁵	\$101	\$91	\$49	\$44	\$101	\$91	\$49	\$44	\$101	\$91	\$49	\$44
Land ⁶	\$161	\$161	\$161	\$161	\$213	\$213	\$213	\$213	\$269	\$269	\$269	\$269
Earnings or (losses)	-\$315	-\$229	-\$236	-\$158	-\$301	-\$205	-\$222	-\$134	-\$265	-\$174	-\$186	-\$103

¹Rotations are as follows: c-c = all of the farm acres in continuous corn; c-b = one-half of the farm acres in rotation corn and one-half in rotation soybeans.

²Crop's contribution margin is the per acre contribution margin from Table 1.

³It is assumed that the upcoming farm bill will provide ARC-County payments in 2016. The 2016 payments will not be received until October 2017.

⁴The same basic machinery set, which is timely for each rotation, is used for both the c-c and c-b rotation. The larger farm size requires larger, more expensive machinery. Corn production utilizes a chisel plow tillage system, and soybeans utilize no-till. Average annual replacement costs for the larger farm size were calculated using the Purdue Machinery Cost Calculator for a timely machinery set. Seven-year trading policy is assumed for combine and planter, 10-year policy for other field machinery. On livestock farms where fewer hours each day are available for crops, or on small farms, machinery costs and/or labor costs will be higher. On well-drained soils where more days are suitable for spring field work, machinery costs could be lower. A 10-year trading policy was assumed for all machinery on the smaller acreages. Machinery ownership costs are likely to vary widely from farm to farm.

⁵For the larger acreages, labor expense includes a family living withdrawal of \$90,577 (\$91,477 of family living expenses less \$40,810 in net nonfarm income plus \$39,910 in income and self-employment taxes); a full-time employee with total compensation of \$39,013; and a part-time employee with compensation of \$3,365. Family living withdrawal information is based on Illinois FBFM summary information. Employee compensation is based on Employee Wage Rates and Compensation Packages on Kansas Farms, Kansas State University, August 2012. For the smaller acreages, labor expense includes the same family living withdrawal and no hired labor. Labor costs are likely to vary widely from farm to farm.

⁶Based on 2015 cash rent per bushel of corn yield reported in the article entitled "The Bears Control the 2015 Indiana Farmland Market," Purdue Agricultural Economics Report, August, 2015. The relatively low estimated contribution margins for 2016 will likely place downward pressure on cash rents, thus 2016 cash rents are assumed to be 5 percent below 2015 cash rents.

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