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DEPARTMENT OF LOCAL GOVERNMENT FINANCE



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REFERENCE MATERIALS FOR VALUING AGRICULTURAL LAND FOR JANUARY 1, 2022

BASE RATE - \$1,500

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January 1, 2022

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General Notes for the Agricultural Land Market
Value in Use for January 1, 2022, Rate of \$1,500

History

December 2021

In compliance with the Town of St. John v. State Board of Tax Commissioners court case, the 2002 Real Property Assessment Guidelines contained a section on valuing agricultural land based on its value in use. A summary of the Department of Local Government Finance's ("Department") calculations can be found in Chapter 2 of those guidelines, in Table 2-18. For the 2002 reassessment, the base rate for agricultural land was calculated to be \$1,050 and remained unchanged for 2003 and 2004.

Pursuant to 50 IAC 27-6-1(a), the Department issued the annual rate for March 1, 2005, to be \$880. In the 2005 legislative session, Senate Enrolled Act ("SEA") 327 was passed. This bill contained a non-code provision that set the base rate for agricultural land for both March 1, 2005, and March 1, 2006, at \$880. SEA 327 also contained language for March 1, 2007, which instructed the Department to adjust the methodology from a four-year rolling average to a six-year rolling average (Ind. Code § 6-1.1-4-4.5).

- The base rate for March 1, 2007, was calculated to be \$1,140 per acre.
- The base rate for March 1, 2008, was updated by removing 1999 data and adding 2005 data to the six-year average which resulted in a base rate of \$1,200.
- The base rate for March 1, 2009, was updated by removing 2000 data and adding 2006 data to the six-year average which resulted in a base rate of \$1,250.
- The base rate for March 1, 2010, was updated by removing 2001 data and adding 2007 data to the six-year average which resulted in a base rate of \$1,400; however, in March of 2010, SEA 396-2010 was signed into law which required the highest year of the six-year average to be excluded in the calculation. This change in the calculation lowered the base rate for March 1, 2010, from \$1,400 to \$1,290 when the 2007 data was excluded.
- The base rate for March 1, 2011, was updated by removing the 2002 data, adding the 2008 data, and excluding the highest year (2008) of the six-year average to arrive at a base rate of \$1,500.
- The base rate for March 1, 2012, was updated by removing the 2003 data, adding the 2009 data, and excluding the highest year (2008) of the six-year average to arrive at a base rate of \$1,630.
- The base rate for March 1, 2013, was updated by removing the 2004 data, adding the 2010 data, and excluding the highest year (2010) of the six-year average to arrive at a base rate of \$1,760.
- The base rate for March 1, 2014, was updated by removing the 2005 data, adding the 2011 data, and excluding the highest year (2011) of the six-year average to arrive at a base rate of \$2,050.
- The base rate for March 1, 2015, was updated by removing the 2006 data, adding the 2012 data, and excluding the highest year (2011) of the six-year average to arrive at a base rate of \$2,420; however, SEA 436-2015 was passed which set the March 1, 2015, base rate at \$2,050 (unchanged from 2014). SEA 436-2015 also established a new method of calculating the base rate for 2016 which took the preceding year's base rate and multiplied it times an assessed value growth quotient; however, in the 2016 legislative session, SEA 308 repealed this new method and re-instated the previous method of using a six-year rolling average with the highest year excluded and added the requirement of using the most current data available and adjusting the capitalization rate after the preliminary base rate was determined.
- The base rate for January 1, 2016, was updated by removing the 2007, 2008, and 2009 data, adding the 2013, 2014, and 2015 data, excluding the highest year (2013) of the six-year

average, and adjusting the capitalization rates per SEA 308-2016 to arrive at a final base rate of \$1,960.

- The base rate for January 1, 2017, was updated by removing the 2010 data, adding the 2016 data, excluding the highest year (2013) of the six-year average, and adjusting the capitalization rates per SEA 308-2016 to arrive at a final base rate of \$1,850.
- The base rate for January 1, 2018, was updated by removing the 2011 data, adding the 2017 data, excluding the highest year (2013) of the six-year average, and adjusting the capitalization rates per SEA 308-2016 to arrive at a final base rate of \$1,610.
- The base rate for January 1, 2019, was updated by removing the 2012 data, adding the 2018 data, excluding the highest year (2013) of the six-year average, and adjusting the capitalization rates per SEA 308-2016 to arrive at a final base rate of \$1,560.
- The base rate for January 1, 2020, was updated by removing the 2013 data, adding the 2019 data, excluding the highest year (2014) of the six-year average, and adjusting the capitalization rates per SEA 308-2016 to arrive at a final base rate of \$1,280.
- The base rate for January 1, 2021, was updated by removing the 2014 data, adding the 2020 data, excluding the highest year (2020) of the six-year average, and adjusting the capitalization rates per SEA 308-2016 to arrive at a final base rate of \$1,290.
- The base rate for January 1, 2022, was updated by removing the 2015 data, adding the 2021 data, revising last year's worksheets with current data, excluding the highest year (2021) of the six-year average, and adjusting the capitalization rates per SEA 308-2016 to arrive at a final base rate of \$1,500.

SEA 308 – The New Calculation of the Agland Base Rate Beginning January 1, 2016

Ind. Code § 6-1.1-4-4.5(e) In making the annual determination of the base rate to satisfy the requirement for an annual adjustment under subsection (c) for the January 1, 2016, assessment date and each assessment date thereafter, the department of local government finance shall not later than March 1 of each year determine the base rate using the methodology reflected in Table 2-18 of Book 1, Chapter 2 of the department of local government finance's Real Property Assessment Guidelines (as in effect on January 1, 2005), except that the department shall adjust the methodology as follows:

- (1) Use a six (6) year rolling average adjusted under subdivision (3) instead of a four (4) year rolling average.
- (2) Use the data from the six (6) most recent years preceding the year in which the assessment date occurs for which data is available before one (1) of those six (6) years is eliminated under subdivision (3) when determining the rolling average.
- (3) Eliminate in the calculation of the rolling average the year among the six (6) years for which the highest market value in use of agricultural land is determined.
- (4) After determining a preliminary base rate that would apply for the assessment date without applying the adjustment under this subdivision, the department of local government finance shall adjust the preliminary base rate as follows:
 - (A) If the preliminary base rate for the assessment date would be at least ten percent (10%) greater than the final base rate determined for the preceding assessment date, a capitalization rate of eight percent (8%) shall be used to determine the final base rate.
 - (B) If the preliminary base rate for the assessment date would be at least ten percent (10%) less than the final base rate determined for the preceding assessment date, a capitalization rate of six percent (6%) shall be used to determine the final base rate.
 - (C) If neither clause (A) nor clause (B) applies, a capitalization rate of seven percent (7%) shall be used to determine the final base rate.

- (D) In the case of a market value in use for a year that is used in the calculation of the six (6) year rolling average under subdivision (1) for purposes of determining the base rate for the assessment date:
- (i) that market value in use shall be recalculated by using the capitalization rate determined under clauses (A) through (C) for the calculation of the base rate for the assessment date; and
 - (ii) the market value in use recalculated under item (i) shall be used in the calculation of the six (6) year rolling average under subdivision (1).

Updates to Table 2-18 for January 1, 2022

Table 2-18 – Years

For January 1, 2022, the six years of data used in the calculations were: 2016, 2017, 2018, 2019, 2020, and 2021.

Table 2-18 – Net Income from Cash Rents

Since agricultural land in Indiana is almost evenly divided between cash rent and owner-occupied production, the Department used an average of both types of income in the calculation.

The data for cash rents came from three Purdue Agricultural Economics Reports (“PAER”). For the 2016 and 2017 rents, go to Table 4 on Page 7 of the August 2017 report. For the 2018 and 2019 rents, go to Table 4 on Page 8 of the August of 2019 report. For the 2020 and 2021 rents, go to Table 4 on Page 7 of the July of 2021 report. From these tables, the Department used the statewide averages for average soil.

There is also an adjustment to these amounts to reduce the rents for property taxes paid on the land. This adjustment was based on an annual study conducted by the Department.

Table 2-18 – Net Income from Operating

This income represents the profits from the owner-occupied production of crops on agricultural land.

The foundation for the calculations that Department adopted comes from Table 1 of the June 24, 1999, Doster/Huie report.

Doster/Huie Report – Table 1-Years

This report used the years 1996, 1997, 1998, and 1999. The year 1999 was removed from the Department’s 2002 calculations since the calculations were based on January 1, 1999. Information for 1995 was obtained and added to the calculations. (Also note the date of June 24, 1999, for the report which means that six months of data had been estimated.)

Doster/Huie Report – Table 1-Yields

The yields in this report were obtained from the Indiana Agricultural Statistics Service (“IASS”) for both corn and soybeans. The IASS publishes these statistics on an annual basis. Yield information for these four years can be found in the 1999-2000 publication for corn in the Final Yield per Acre column of the Crop Summary section and on for soybeans.

Doster/Huie Report – Table 1-Prices

The prices used in this report were for November. They can be found in IASS publications for that time period. Note: The Department made an adjustment to this part of the calculation because the

majority of the grain harvested in Indiana is not sold in November but throughout the year. This adjustment will be discussed later.

Doster/Huie Report – Table 1-Sales

Yields for each type of crop (corn/soybeans) multiplied by the Price per Bushel for each type of crop equals Sales.

Doster/Huie Report – Table 1-Less Variable Costs

This information can be found in the Purdue Crop Guide. This guide is an annual publication (ID-166). The dollar amount for each crop type can be found in the section titled “Estimated XXXX (year) Per Acre Production Costs in the column for Corn/Soybean Rotation for Average Soil. See the line for “Total direct cost per acre at harvest”. The costs include labor, seed, fertilizer, chemicals, machinery repairs, and fuel.

Doster/Huie Report – Table 1-Crop Contribution Margin

Sales less Variable Costs equal Crop Contribution Margin for each type of crop (corn/soybeans).

Doster/Huie Report – Table 1-Plus Government Payment

The publication adds government payments as a source of additional revenue for the land. This amount for each year was estimated by the authors of the publication.

Doster/Huie Report – Table 1-Total Contribution Margin

This number represents the average of the Crop Contribution Margin for corn and soybeans plus one-half (1/2) of the amount for the government payment. (The sum of the three numbers divided by two.)

Doster/Huie Report – Table 1-Less Overhead

The overhead expense for machinery, drying/handling, and family/hired labor can be found on the Purdue Crop Guide (ID-166). The dollar amount for each crop type can be found in the section titled “Estimated 20__ (year) Per Acre Production Costs in the column for Corn/Soybean Rotation for Average Soil. See the lines for “Indirect charges per acre”.

Doster/Huie Report – Table 1-Real Estate Tax

A deduction of \$10 for real estate taxes was estimated by the authors.

Doster/Huie Report – Table 1-Income

Total Contribution Margin less the Overhead Expenses of machinery, drying/handling, labor, and real estate taxes equal Income.

Doster/Huie Report – Table 1-Estimated Land Value

The authors of the paper then averaged the four years (1996 – 1999) income and divided it by a 1999 interest rate to arrive at an Estimated Land Value of \$971.

Table 2-18 – Net Income from Operating

This income represents the profits from the owner-occupied production of crops on agricultural land. While the foundation for the calculations that the Department adopted comes from Table 1 of June 24, 1999, Doster/Huie report, the Department did make some alterations to it.

Adjustments Made to The Doster/Huie Report by the Department

Years

The Department added the statistics for 1995 which were available and deleted the estimates for 1999 since interest rates and income data were not available.

Price

The Department added two averages to the Doster/Huie report since this report used only November prices. Since only a small portion of Indiana's grain is sold in November, the Department developed two annual averages for the calculation. The first average was the calendar year average of the grain prices which are published in the IASS book. The second average was the market year average. This average is calculated by the IASS and is a weighted average that is based on the end of the month's grain price and the percentage of the total grain harvested that was sold that month.

Interest Rate

Instead of using the 1999 St. Paul Farm Credit Bank interest rate, the Department chose to use the quarterly farm loan rates published by the Federal Reserve Bank of Chicago ("FRBC"). The FRBC publishes an agricultural newsletter quarterly called the "AgLetter". This newsletter provides interest rates on farm loans for operating loans, feeder cattle, and real estate. The Department averaged the interest rates for the operating loans and real estate categories. A study was conducted on different sources of interest rates between Purdue Agricultural Economics Reports, the St. Paul Farm Credit Bank, and the Federal Reserve Bank of Chicago. The study found that the rates varied from year to year but when averaged out over the four years were comparable.

Summary of the January 1, 2022, Base Rate

The Department first calculated the Table 2-18 Base Rate with data for the years 2016, 2017, 2018, 2019, 2020, and 2021. Current data was used, and last year's worksheets were updated for this year's calculation when needed. Next, the highest market value-in-use for one of the years (2021) in the six-year rolling average was eliminated from the calculation. Then the implementation of SEA 308-2016 determined the capitalization rate of 8% which lowered the Preliminary Table 2-18 Base Rate of \$2,410 to a Final Base Rate of \$1,500.

Note: A simple explanation for the increase from last year's base rate of \$1,290 to this year's rate of \$1,500 is that the data for 2015 dropped off of the six-year rolling average this year and the data for 2021 was added. The 2015 data used in last year's calculation was the lowest of the six years and the 2021 data used in this year's calculation was the highest of the six years and by statute was excluded from the calculation. This means the lower 2015 data was replaced by the higher 2020 data. (The 2020 data was the highest in last year's calculation and was excluded last year.)

- units of measurement for agricultural land
- classification of agricultural land into land use types
- use of soil maps
- calculating the soil productivity index
- valuation of strip mined agricultural land
- valuation of oil and gas interests

Agricultural Land Base Rate Value

The 2019 general reassessment agricultural land value utilizes the land's current market value, which is based on the productive capacity of the land, regardless of the land's potential or highest and best use. The most frequently used valuation method for use-value assessment is the income capitalization approach. In this approach, use-value is based on the residual or net income that will accrue to the land from agricultural production.

As illustrated in the following equation, the market value of agricultural land is calculated by dividing the net income of each acre by the appropriate capitalization rate.

$$\text{Market value} = \text{Net Income} \div \text{Capitalization Rate}$$

The net income of agricultural land can be based on either the net operating income or the net cash rent. Net operating income is the gross income received from the sale of crops less the variable costs (i.e. seed and fertilizer) and fixed costs (i.e. machinery, labor, property taxes) of producing crops. The net cash rent income is the gross cash rent of an acre of farmland less the property taxes on the acre. Both methods assume the net income will continue to be earned into perpetuity.

The capitalization rate converts the net income into an estimate of value. The capitalization rate reflects, in percentage terms, the annual income relative to the value of an asset; in this case agricultural land. Conceptually, this capitalization rate incorporates the required returns to various forms of capital, associated risks, and the anticipated changes over time.

Since agricultural land in Indiana is nearly evenly divided between cash rent and owner-occupied production, the Department utilized a six-year rolling average of both methods in determining the market value of agricultural land. The capitalization rate applied to both types of net income was based on the annual average interest rate on agricultural real estate and operating loans in Indiana for this same period. The table below summarizes the data used in developing the average market value.

Table 2-18 Agricultural Land Value

Year	NET INCOMES			MARKET VALUE IN USE		
	Cash Rent	Operating	Cap. Rate	Cash Rent	Operating	Average
2013	204	341	8.00%	2,550	4,263	3,406
2014	205	171	8.00%	2,563	2,138	2,350
2015	198	-39	8.00%	2,475	-488	994
2016	173	75	8.00%	2,163	938	1,550
2017	175	30	8.00%	2,188	375	1,281
2018	181	79	8.00%	2,263	988	1,625

Assessing Agricultural Land

The agricultural land assessment formula involves identifying agricultural tracts using data from a detailed soil map, aerial photography, and local plat maps. Each variable of the land assessment formula is measured using various devices to determine its size and effect on the parcel's assessment. The proper use of the soil maps, interpreted data, and unit values results in greater uniformity in the assessment process of agricultural lands.

Indiana Code section 6-1.1-4-13(a) declares, “**In assessing or reassessing land, the land shall be assessed as agricultural land *only when it is devoted to agricultural use***” [emphasis added]. Indiana Code section 6-1.1-4-13(e) states, “This section does not apply to land purchased for industrial or commercial uses.”

Pursuant to Indiana Code section 6-1.1-4-13, land “devoted to agricultural use” shall be assessed as agricultural land. However, land “*purchased for*” an industrial or commercial uses shall not be assessed as agricultural land. Additionally, all land *utilized* for agricultural purposes is valued as agricultural land -- using a statewide base rate and a soil productivity index system. Unless provided elsewhere in the law, the Manual, or Guidelines, the parcel's size does not determine the property classification or pricing method for the parcel. Rather, the property classification and pricing method are determined by the property's use or zoning. For example, some commercial and industrial zoned acreage tracts devote a portion of the parcel to an agricultural use. The assessing official must classify these parcels as either commercial or industrial. However, the portions of land devoted to agricultural use are to be valued using the agricultural land assessment formula. Portions not used for agricultural purposes are to be valued using the commercial and industrial acreage guidelines. To illustrate:

- (1) A major industrial corporation purchased a 40 acre cornfield to locate a corn processing facility in Indiana. After undergoing the local zoning process, the entire parcel was re-zoned from agricultural zoning to industrial zoning. The corporation has utilized 15 acres of the parcel by constructing a manufacturing and warehouse facility with the idea that the remaining 25 acres would be

available for future expansion, if necessary. The 25 acres in reserve is currently being cash rented to a local agricultural producer, who row-crops the acreage.

Conclusion: The assessor should assign a property classification of 310 - Food and Drink Processing Facility - to the 40 acre parcel. The 15 acre portion of the acreage that is utilized for industrial purposes should be assigned land use codes representing the industrial acreage base rates for that particular area of the jurisdiction. The 25 acre portion of the parcel that is being row-cropped by the local farmer should be priced using the agricultural productivity method of pricing. The 25 acres would have the soil types delineated by soil type, have each type soil analyzed for its land cover class, and have its assessment calculated using the agricultural base rate.

(2) The ACME Development Company purchased a 30 acre parcel of land that was being used for agricultural purposes. ACME appeared before the local zoning officials and received a zoning change for the front 10 acres as to be commercial retail, and the rear 20 acres, which has access from an adjoining state highway, was zoned for a commercial office. ACME immediately began constructing a retail shopping complex on the front 10 acres of the parcel. The 20 acres is being cash rented to a local farmer, but is offered for sale by a local real estate broker.

Conclusion: The 30 acre parcel should have a property class designation of 326 -- Neighborhood Shopping Center assigned to it. The front 10 acre commercial portion of the parcel should be valued using the commercial acreage base rate for this area of the jurisdiction. The rear 20 acres that is being farmed should be priced using the agricultural productivity method of pricing. The 20 acres should have the soil types delineated by soil type, have each type soil analyzed for its land cover class, and have its assessment calculated using the agricultural base rate for that particular year.

(3) The Good Development (GDC) purchased a 20 acre parcel that was being used for agricultural purposes and had a property class code of 100 – Vacant land. The agricultural productivity method of calculating an assessment valued the parcel at \$22,800 at the time of the purchase in October 2018. GDC purchased the land for the purpose of platting and developing a 40 lot residential subdivision. Once the local Area Planning Commission granted approval for the subdivision and changed the zoning from agricultural to residential, GDC did all the necessary paperwork and filed the plat with the county recorder's office in February 2008.

Conclusion: For January 1, 2019, the county auditor follows Indiana Code section 6-1.1-5-3 and assigns parcel numbers to the 40 lots indicated on the plat of the subdivision and notifies the assessing official that the 20 acre parcel has become 40 lots, which need to be assessed for January 1, 2019. The assessing official acknowledges that GDC is the developer by reviewing the plat and, based

on Indiana Code section 6-1.1-4-12(i), knows that the overall assessment cannot be increased because the acreage has become 40 platted lots. However, the agricultural base rate within the agricultural productivity formula has increased from \$1,140 to \$1,200 for January 1, 2019. Before removing the 20 acre parcel from the computer system, the assessor recalculates an assessment for that parcel using the new 2008 rate of \$1,200. The True Tax Value for this particular 20 acre parcel would equal \$24,000, if not platted into the 40 lots. Based on the language of Indiana Code section 6-1.1-4-12(i), each of the 40 parcels would have an assessed value of \$600 ($\$24,000 / 40 \text{ lots} = \600 per lot). The application of this True Tax Value can be achieved in either of two ways:

- (a) a flat value amount of \$600 can be applied to each of the 40 property record cards; or
- (b) the assessing official can calculate the assessment by determining the lots size of each parcel, applying a front foot or acreage base rate that calculates the applicable 2019 value of improved land in the extended value area of the land summary section of the property record card, and granting influence factor adjustments to each parcel that makes the value of each parcel equal to \$600 per lot.

Land purchased and used for an agricultural purpose qualifies for all land use types associated with the agricultural classification and agricultural soil productivity method of pricing. This includes cropland or pasture land (i.e., tillable land) as well as woodlands

Indiana Code section 6-1.1-4-12 states that if land assessed on an acreage basis (i.e., agricultural land) is subdivided into lots; or land is rezoned for, or put to, a different use, the land shall be reassessed on the basis of its new classification. If improvements are added to real property, the improvements shall be assessed. Such an assessment or reassessment is effective on the next assessment date. For example, a corporation that purchased farmland, subdivided it into residential lots, and sold all but one lot, retaining ownership and converting that vacant lot into an income-producing shopping center, was not entitled to retain the lot's agricultural classification for property tax purposes. The land was properly re-classified from "agricultural" to "commercial" to reflect the land's change in use. *See Aboite Corp. v. State Bd. of Tax Com'rs*, 762 N.E.2d 254 (Ind. Tax Ct. 2001); *see also Howser Development LLC v. Vienna Twp Assessor*, 833 N.E.2d 1108 (Ind. Tax Ct. 2005).

However, Indiana Code section 6-1.1-4-12(i) and (j), added by Public Law 154-2006, clarifies the "developer's discount" for assessments. The "developer's discount" is designed to encourage developers to buy farmland, subdivide into lots, and resell the lots. A lot, or a tract that has not been subdivided into lots, to which a land developer holds title in the ordinary course of its business, may *not* be reassessed until the next assessment date following the earliest of:

- (1) the date on which title to the land is transferred by the land developer (or successor land developer) to a person that is not a land developer; or
- (2) the date on which construction of a structure begins on the land; or
- (3) the date on which a building permit is issued for construction of a building or structure on the land.

The “developer’s discount” applies regardless of whether the lot or tract is rezoned while a land developer holds title to the land. Thus, until one of the aforementioned events occurs, the land developer “reaps the benefit” of the lower agricultural land assessment.

Therefore, the controlling factors that determine whether land is to be assessed as agricultural land are whether the land was purchased for a non-agricultural use, and whether the land is currently used or zoned for an agricultural purpose; however, in some instances, the “developer’s discount” may apply and reassessment of the land may not occur until transfer of title to a non-developer, the start of construction of a building, or the issuance of a construction permit.

The definition of “agricultural land” provides ample basis for the vast majority of assessor decisions. These guidelines were adopted as directed in IC 6-1.1-4-13(d) and incorporated by reference into 50 IAC 2.4-1-2.

IC 6-1.1-4-13

Agricultural land; assessment

Sec. 13. (a) In assessing or reassessing land, the land shall be assessed as agricultural land only when it is devoted to agricultural use.

(b) For purposes of this section, and in addition to any other land considered devoted to agricultural use, any:

- (1) land enrolled in:
 - (A) a land conservation or reserve program administered by the United States Department of Agriculture;
 - (B) a land conservation program administered by the United States Department of Agriculture's Farm Service Agency; or
 - (C) a conservation reserve program or agricultural easement program administered by the United States Department of Agriculture's National Resources Conservation Service;
- (2) land enrolled in the department of natural resources' classified forest and wildlands program (or any similar or successor program);
- (3) land classified in the category of other agriculture use, as provided in the department of local government finance's real property assessment guidelines; or
- (4) land devoted to the harvesting of hardwood timber;

is considered to be devoted to agricultural use. Agricultural use for purposes of this section includes but is not limited to the uses included in the definition of

“agricultural use” in IC 36-7-4-616(b), such as the production of livestock or livestock products, commercial aquaculture, equine or equine products, land designated as a conservation reserve plan, pastureland, poultry or poultry products, horticultural or nursery stock, fruit, vegetables, forage, grains, timber, trees, bees and apiary products, tobacco, other agricultural crops, general farming operation purposes, native timber lands, or land that lays fallow. Agricultural use may not be determined by the size of a parcel or size of a part of the parcel. This subsection does not affect the assessment of any real property assessed under IC 6-1.1-6 (assessment of certain forest lands), IC 6-1.1-6.2 (assessment of certain windbreaks), or IC 6-1.1-6.7 (assessment of filter strips).

(c) The department of local government finance shall give written notice to each county assessor of:

(1) the availability of the United States Department of Agriculture's soil survey data; and

(2) the appropriate soil productivity factor for each type or classification of soil shown on the United States Department of Agriculture's soil survey map.

All assessing officials and the property tax assessment board of appeals shall use the data in determining the true tax value of agricultural land. However, notwithstanding the availability of new soil productivity factors and the department of local government finance's notice of the appropriate soil productivity factor for each type or classification of soil shown on the United States Department of Agriculture's soil survey map for the March 1, 2012, assessment date, the soil productivity factors used for the March 1, 2011, assessment date shall be used for the January 1, 2016, assessment date and each assessment date thereafter.

(d) The department of local government finance shall by rule provide for the method for determining the true tax value of each parcel of agricultural land.

(e) This section does not apply to land purchased for industrial or commercial uses.

There is a subtle distinction between residential acreage tracts and land valued using the agricultural soil productivity method. The basis for this distinction is the different valuation methods used to determine land value for the two types of land. “Agricultural land” is valued using a statewide base rate and a soil productivity index system. All land utilized for agricultural purposes is valued in this manner. “Residential land” is land that is utilized or zoned for residential purposes.

Other References

a. Assessors are further directed that all acres enrolled in programs of the United States Department of Agriculture (USDA), Farm Services Agency, and Natural Resources Conservation Service and have received a “farm number” are eligible for classification as “agricultural.” Those acres have been determined by those administering federal programs to be a part of an “agricultural operation.” This applies to non-homestead acreage.

- b.** As further evidence of the proper classification of woodlands as agricultural land, the Indiana State Department of Agriculture (ISDA) considers the growing of timber as an agricultural activity by identifying the need to “increase Indiana’s competitiveness in the hardwood sector” as one of its eight major strategies. The Department’s practices and rules support the assertion that the growing of timber is a viable Indiana agricultural crop and should be assessed as such.
- c.** The Department recognizes that certain circumstances may blur the line between the residential property class designation and the agricultural designation when wooded areas are involved. In the preparation of this memorandum, the Department has consulted with the Department of Natural Resources (DNR). The DNR monitors Indiana’s timberland and classified forest programs. In its implementation of the Classified Forest and Wildland Certification Program authorized in IC 6-1.1-6, participating woodland owners with 10 acres or more automatically qualify for the American Tree Farm System’s certification benefits, which include marketing the forest’s products as “green certified.” The Classified Forest and Wildland Program materials also state that timber harvest is not required to qualify for the classification program. The Department believes that the guidelines used for the classified program are applicable when distinguishing agricultural use from non-agricultural use, but other agricultural uses may qualify a parcel for the productivity method of valuation.

Parcel Size

As stated above, the issue of parcel size has no bearing on the appropriate classification or pricing method of agricultural land, whether the parcel is wooded or used for other agricultural activities.

Other Agricultural Uses

- a.** A 40 acre parcel, which at one time was a small farm, has since become a mixture of small, scattered trees and brush with less than 50% canopy cover. The assessor classified this parcel as residential excess acreage; the effect of which created a higher assessed value and tax burden than the agricultural soil productivity method.

Conclusion: The current owner purchased the parcel as an agricultural property many years ago. The land is currently uncultivated or fallow, but has not changed use nor been re-zoned. This parcel should continue to be classified as agricultural as it was purchased for agricultural use and is used as “non-tillable land” as defined in the *Guidelines*.

- b.** A five acre parcel has a one acre homesite and cattle grazing on the remaining four acres. The assessor classified the four acres using the residential excess acreage rate and refuses to acknowledge the presence of grazing cattle as an agricultural activity because the parcel is less than 10 acres. The county has an

unofficial policy of denying agricultural classification to parcels of less than 10 acres.

Conclusion: The grazing of cattle is an agricultural activity; thus, the parcel should be assessed using the agricultural productivity method as it meets the definition of “agricultural operation” in IC 32-30-6-1 and in the *Guidelines*, which define agricultural “tillable land” as land used “for cropland or pasture that has no impediments to routine tillage.” The size of the parcel has no bearing on the determination of agricultural classification.

c. A five acre parcel has a one acre home site and the remaining four acres is devoted to hay production. The county classified the hay field using the residential excess acre rate. The owner has a signed statement from a neighboring dairy farmer that the neighbor harvests the hay from the field for his cattle.

Conclusion: The acreage meets the criteria of agricultural “tillable land” as defined in the *Guidelines*. The four acres should be priced using the agricultural soil productivity method. The size of the parcel has no bearing on the determination of agricultural classification.

STATE OF INDIANA

DEPARTMENT OF LOCAL GOVERNMENT FINANCE



INDIANA GOVERNMENT CENTER NORTH
100 NORTH SENATE AVENUE N1058(B)
INDIANAPOLIS, IN 46204
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Certification of Agricultural Land Base Rate Value for Assessment Year 2022

This memorandum hereby serves to notify assessing officials of the agricultural base rate to be used for the January 1, 2022, assessment date: **\$1,500 per acre**.

Land used for agricultural purposes shall be adjusted consistent with the guideline methodology that was in effect on January 1, 2005, except, in determining the annual base rate, the Department of Local Government Finance (“Department”) shall adjust the methodology to use the lowest five years of a six (6) year rolling average. Senate Enrolled Act 308 then requires a comparison of the preliminary Table 2-18 base rate to the prior year’s Table 2-18 base rate in order to determine the statutory capitalization rate to be used to calculate the final base rate for this assessment date.

Those portions of agricultural parcels that include land and buildings not used agriculturally, such as homes, homesites, and excess land and commercial or industrial land and buildings, shall be adjusted by the factor or factors developed for other similar property within the geographic stratification. The residence portion of agricultural properties will be adjusted by the factors applied to similar residential properties. 50 IAC 27-6-1 (b)

The 2022 assessment year agricultural land value utilizes the land’s current market value in use, which is based on the productive capacity of the land, regardless of the land’s potential or highest and best use. The most frequently used valuation method for use-value assessment is the income capitalization approach. In this approach, use-value is based on the residual or net income that will accrue to the land from agricultural production.

As illustrated in the following equation, the market value in use of agricultural land is calculated by dividing the net income of each acre by the appropriate capitalization rate.

$$\text{Market value in use} = \text{Net Income} \div \text{Capitalization Rate}$$

The net income of agricultural land can be based on either the net operating income or the net cash rent. Net operating income is the gross income received from the sale of crops less the variable costs (i.e., seed and fertilizer) and fixed costs (i.e., machinery, labor, property taxes) of producing crops. The net cash rent income is the gross cash rent of an acre of farmland less the property taxes on the acre. Both methods assume the net income will continue to be earned into perpetuity.

The capitalization rate converts the net income into an estimate of value. The capitalization rate reflects, in percentage terms, the annual income relative to the value of an asset, in this case, agricultural land. Conceptually, this capitalization rate incorporates the required returns to various forms of capital, associated risks, and the anticipated changes over time. Since

agricultural land in Indiana is nearly evenly divided between cash rent and owner-occupied production, the Department utilized a six-year rolling average (2016 to 2021) of both methods in determining the market value in use of agricultural land. The capitalization rate applied to both types of net income was based on the language contained in SEA 308. The table below summarizes the data used in developing the average market value in use.

Senate Enrolled Act 308 – Final Agricultural Land Base Rate

Year	<u>NET INCOMES</u>			<u>MARKET VALUE IN USE</u>		
	Cash Rent	Operating	Cap. Rate	Cash Rent	Operating	Average
2016	173	75	8.00%	2,163	938	1,550
2017	175	30	8.00%	2,188	375	1,281
2018	181	51	8.00%	2,263	638	1,450
2019	181	6	8.00%	2,263	75	1,169
2020	192	135	8.00%	2,400	1,688	2,044
2021	206	288	8.00%	2,575	3,600	3,088
				Average		
				Market Value in Use	\$1,500	

The statewide agricultural land base rate value for the 2022 assessment year will be \$1,500 per acre.

Dated this 27th day of December 2021.



 Wesley R. Bennett, Commissioner
 Department of Local Government Finance

A Method for Assessing Indiana Cropland An Income Approach to Value

D. Howard Doster & John M. Huie, Purdue Ag Economists
June 24, 1999

Summary

A method for taxing agricultural cropland based on the income potential of the land can be developed. The method is illustrated below. Data components of this method include detailed soil maps, estimated yields and production costs by soil type, reported average yields by county, reported average Indiana November corn and soybean prices, USDA corn and soybean loan prices by county, and the interest rate on new Farm Credit Bank loans in the St Paul district.

Using this information, a land value can be calculated for each soil type in each county in Indiana. Using detailed soil maps, county staff can then calculate income, land value, and tax due for each ownership parcel.

Using state yields, prices, and costs for 1996, 1997, 1998, and estimates for 1999, income and land values are calculated below for average and high yield soil types. As shown in Table 1, the average land value is calculated to be \$971. In Table 2, the high yield land is valued at \$1510.

As shown in the tables, incomes for 1996 and 1997 are much higher than incomes for 1998 and projected 1999. Though not shown, income for 1995 was much higher than projected income for 1999.

Detailed soil maps

Maps from The Natural Resource and Conservation Service (NRCS) are now available for all counties indicating the soil type of all land in the state. County staff have used this information in past years. For five counties, this soil type information has been transferred to a GIS data base. In these counties, county staff could identify land ownership units in the GIS data base and with appropriate computer software, calculate the real estate tax on cropland.

In 1998, computer software was developed by Purdue Ag Economists for calculating income for user entered ownership parcels in Tippecanoe County. This program was shown at the July, 1998 Purdue Top Farmer Crop Workshop and the September, 1998 Prairie Farmer Farm Progress Show. The purpose of these demonstrations was to show prospective landowners, prospective tenants, and professional appraisers a way to estimate income potential of an ownership parcel.

Estimated yield and production cost by soil type

Purdue agronomists and NRCS staff have estimated crop yields for each soil type in Indiana. (These yield estimates may need to be updated, and possible differences considered for the same soil type in different counties.) Purdue staff annually estimate crop production costs for low, average, and high yielding soil types. The process could be computerized and budgets could be prepared for all Indiana soils.

Reported average yield by county

The Indiana Agricultural Statistics Service reports average yield for each county in May each year for the preceding year's crops. An expected trend yield could be calculated for each soil in each county. Each year, these trend yields could be adjusted by the same percentage change as the difference between the county expected and reported average yields.

Reported average Indiana November corn and soybean prices

The Indiana Agricultural Statistics Service reports average Indiana crop prices for each month. Prices for November^{1/} are used in calculating per acre corn and soybean income.

USDA corn and soybean loan price

USDA has determined corn and soybean loan prices for each Indiana county. These prices reflect crop price differences because of the location of the county. Therefore, the November state average prices for corn and soybeans could be adjusted by the price location differences in loan prices to obtain an estimate of November prices by county.

St Paul Farm Credit Bank interest rate

For each year, the Internal Revenue Service issues a listing of the average annual effective interest rates charged on new loans under the Farm Credit Bank system. These rates are used in computing the special use value of real property used as a farm for which an election is made under section 2032A of the Internal Revenue Code. Indiana is in the St Paul district. For 1999, the reported interest rate is .0821.

Weighted annual incomes and estimated land values

As shown in Table 1, the 4-year average annual income is \$80 and the estimated land value is \$971. As shown in Table 2, for the high yield land the average income is \$124 and the land value is \$1510.

Annual incomes could be weighted with income from the most recent year being weighted the most. One option would be a percentage weight of 40 - 30 - 20 - 10 with the most recent year at 40% and the most distant year at 10%. Using this criteria, the weighted average annual income is \$71.10 and the estimated average land value is \$866. A weighting of 33 - 27 - 22 - 18 with the most recent year at 33% and the most distant year at 18% produces a weighted average annual income of \$75.27 and an estimated average land value of \$917.

For high yield soil, the 40 - 30 - 20 - 10 optimal weights give an average income of \$113 and a land value of \$1379. The 33 - 27 - 22 - 18 weights give an average income of \$118 and a land value of \$1442.

This approach - discounting the potential agricultural income - to valuing farm land is reasonable so long as the income estimates and the discount rates are defensible. There is also logic to using a four year average with the most recent years being weighted higher, especially if the state were to go to annual assessments. So long as they stay with a four year assessment cycle it becomes more of a judgement call.

^{1/}Prices tend to increase throughout the year. November, a month close to the end of the harvest season was chosen. If prices later than November are chosen then a storage cost would also need to be included.

Income and land value estimates

As illustrated in Tables 1 and 2, income from a corn/soybean rotation on average and high yield soils is calculated for 1996-99.

State average yields for each soil are multiplied by November prices to obtain per acre sales.

Variable costs as found in the Purdue Crop Guide for average and high yield soils are subtracted to obtain per acre contribution margin from crops.

Corn contribution margin plus soybean contribution margin plus government payment is added and the sum is divided by 2 to get per acre total contribution margin.

Overhead costs from the Purdue Crop Guide for a corn/soybean farm are subtracted from the contribution margin to get per acre income.

Incomes for the four years are averaged.

The average income is divided by the St Paul interest rate to get estimated land value.

Table 1. Indiana Land Value Calculation
Based on an Income Approach, 1996-99
Average Yield Soil

	1996		1997		1998		1999	
	Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans
Yield ^{1/}	123	38	122	43.5	132	42	134.1	42.9
Price (November) ^{1/}	<u>\$2.69</u>	<u>\$6.90</u>	<u>\$2.60</u>	<u>\$6.88</u>	<u>\$2.06</u>	<u>\$5.49</u>	<u>\$2.04</u>	<u>\$5.40</u>
Sales	\$331	\$262	\$317	\$299	\$282	\$231	\$274	\$232
Less variable costs ^{2/}	<u>134</u>	<u>94</u>	<u>137</u>	<u>96</u>	<u>148</u>	<u>85</u>	<u>145</u>	<u>86</u>
Crops contribution margin	\$197	\$168	\$180	\$203	\$134	\$146	\$129	\$146
Plus government payment ^{3/}	<u>\$23</u>		<u>\$45</u>		<u>\$53</u>		<u>\$34</u>	
Total contribution margin	\$194		\$214		\$167		\$154	
Less overhead:								
Annual machinery ^{2/}	48		50		49		49	
Drying/handling	6		6		7		7	
Family/hired labor ^{2/}	37		37		37		37	
Real estate tax ^{3/}	<u>10</u>		<u>10</u>		<u>10</u>		<u>10</u>	
Equals:								
Income	\$93		\$111		\$64		\$51	

4-year average income = \$80
1999 St Paul interest rate^{4/} = .0821
Estimated land value = \$971

^{1/} State average yield, state average November price as reported by Indiana Agricultural Statistics Service.

^{2/} Costs are taken from annual Purdue Crop Guide, ID-166.

^{3/} Government payments and real estate tax are estimated by the author.

^{4/} Average annual effective interest rate on new loans under the Farm Credit Bank System, St Paul district.

Table 2. Indiana Land Value Calculation
Based on an Income Approach, 1996-99
High Yield Soil

	1996		1997		1998		1999	
	Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans
Yield ^{1/}	151.3	46.8	49.9	53.6	169	51	165	52.8
Price (November) ^{1/}	<u>\$2.69</u>	<u>\$6.90</u>	<u>\$2.60</u>	<u>\$6.88</u>	<u>\$2.06</u>	<u>\$5.49</u>	<u>\$2.04</u>	<u>\$5.40</u>
Sales	\$407	\$323	\$390	\$369	\$348	\$280	\$337	\$285
Less variable costs ^{2/}	<u>153</u>	<u>103</u>	<u>157</u>	<u>106</u>	<u>170</u>	<u>91</u>	<u>167</u>	<u>92</u>
Crops contribution margin	\$254	\$220	\$233	\$263	\$178	\$189	\$170	\$193
Plus government payment ^{3/}	<u>\$29</u>		<u>\$56</u>		<u>\$64</u>		<u>\$42</u>	
Total contribution margin	\$252		\$276		\$216		\$202	
Less overhead:								
Annual machinery ^{2/}	53		55		54		54	
Drying/handling	7		7		8		8	
Family/hired labor ^{2/}	37		37		37		37	
Real estate tax ^{3/}	<u>14</u>		<u>14</u>		<u>14</u>		<u>14</u>	
Equals:								
Income	\$141		\$163		\$103		\$89	

4-year average income = \$124
 1999 St Paul interest rate^{4/} = .0821
 Estimated land value = \$1510

^{1/} State average yield, state average November price as reported by Indiana Agricultural Statistics Service.

^{2/} Costs are taken from annual Purdue Crop Guide, ID-166.

^{3/} Government payments and real estate tax are estimated by the author.

^{4/} Average annual effective interest rate on new loans under the Farm Credit Bank System, St Paul district.

January 1, 2022

Senate Enrolled Act 308 - Assignment of Capitalization Rate To Determine Final Base Rate Per IC 6-1.1-4-4.5 (e)

Department of Local Government Finance's Table 2-18 Calculation of Agricultural Land Base Rate

Year	NET INCOMES PER ACRE		RATE	MARKET VALUE IN USE PER ACRE		AVERAGE MARKET VALUE IN USE PER ACRE
	Cash Rent	Owner-Operated		Cash Rent	Owner-Operated	
2016	173	75	4.78%	3,619	1,569	2,594
2017	175	30	5.04%	3,472	595	2,034
2018	181	51	5.58%	3,244	914	2,079
2019	181	6	5.53%	3,273	108	1,691
2020	192	135	4.50%	4,267	3,000	3,633
2021	206	288	4.21%	4,893	6,844	5,867
Preliminary Table 2-18 Base Rate (Average - 5 Lowest Years)						2,410

Determination of SEA 308 Capitalization Rate:

Prior Year's Final Base Rate 1,290
 Current Year's Preliminary Base Rate 2,410
 Percent Difference 86.8%
 SEA 308 Capitalization Rate To Use: 8%

IC 6-1.1-4-4.5 (e) (4) (See statute for exact language)
 (A.) If there is an increase of 10% or more, the rate will be 8%.
 (B.) If there is a decrease of 10% or more, the rate will be 6%.
 (C.) If neither (A.) or (B.) applies, the rate will be 7%.

Department of Local Government Finance's SEA 308 Calculation of Final Agricultural Land Base Rate

Year	NET INCOMES PER ACRE		RATE	MARKET VALUE IN USE PER ACRE		AVERAGE MARKET VALUE IN USE PER ACRE
	Cash Rent	Owner-Operated		Cash Rent	Owner-Operated	
2016	173	75	8.00%	2,163	938	1,550
2017	175	30	8.00%	2,188	375	1,281
2018	181	51	8.00%	2,263	638	1,450
2019	181	6	8.00%	2,263	75	1,169
2020	192	135	8.00%	2,400	1,688	2,044
2021	206	288	8.00%	2,575	3,600	3,088
SEA 308 Final Base Rate (Average - 5 Lowest Years)						1,500

Table 2-18 - Updated for January 1, 2022
 Source: Real Property Assessment Guidelines

	Column A	Column B	Column C	Column D	Column E	Column F
Year	Cash Rent	Owner-Operated	RATE	Cash Rent	Owner-Operated	AVERAGE MARKET VALUE IN USE PER ACRE
	PER ACRE	PER ACRE	PER ACRE	PER ACRE	PER ACRE	PER ACRE
2016	173	P-17 75	P-33 4.78%	3,619	1,569	2,594 (1)
2017	175	P-17 30	P-33 5.04%	3,472	595	2,034 (1)
2018	181	P-17 51	P-33 5.58%	3,244	914	2,079 (1)
2019	181	P-17 6	P-33 5.53%	3,273	108	1,691 (1)
2020	192	P-17 135	P-33 4.50%	4,267	3,000	3,633 (1)
2021	206	P-17 288	P-33 4.21%	4,893	6,841	5,867 (1)

Base Rate 2,410 (2)
 (Average - 5 Lowest Years)

Formula: Gross Cash Rent Less Property Taxes
 Gross Income Less Expenses
 Average of Qtrly. Farm Loan Rates
 Column A divided by Column C
 Column B divided by Column C
 The average of Columns D and E (1)

Source: Purdue Ag. Econ. Reports (PAER)
 Indiana Ag. Statistics Service and Purdue Crop Guide
 Federal Reserve Bank of Chicago
 The base rate is the average of the 5 lowest averages above rounded to the nearest \$10.
 [IC 6-1.1-4-4.5 (e) (2)] (2)

As illustrated in the following equation, the market value in use of agricultural land is calculated by dividing the net income of each acre by the appropriate capitalization rate.

$$\text{Market Value In Use} = \frac{\text{Net Income}}{\text{Capitalization Rate}}$$

Table 2-18 - Updated for January 1, 2022
 Calculation for Net Income-Cash Rent Column

<u>Year</u>	<u>Gross Cash Rent</u>	<u>Less Property Taxes</u>	<u>Net Cash Rent</u>	<u>Cap. Rate</u>	<u>Cash Rent Value</u>
2016	204	-31	173	4.78%	3,619
2017	205	-30	175	5.04%	3,472
2018	210	-29	181	5.58%	3,244
2019	207	-26	181	5.53%	3,273
2020	217	-25	192	4.50%	4,267
2021	227	-21	206	4.21%	4,893

PURDUE AGRICULTURAL ECONOMICS REPORT

YOUR SOURCE FOR IN-DEPTH AGRICULTURAL
NEWS STRAIGHT FROM THE EXPERTS.

AUGUST 2017

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INDIANA FARMLAND VALUES AND CASH RENTS CONTINUE TO ADJUST

CRAIG DOBBINS, PROFESSOR OF AGRICULTURAL ECONOMICS
KIM COOK, RESEARCH ASSOCIATE IN AGRICULTURAL ECONOMICS

Midwest farmland value news has been mixed this summer. Some reports indicate current farmland values are the same or a little higher than last year or last quarter. Other reports indicate farmland values continue a downward adjustment. The May *AgLetter* issued by the Federal Reserve Bank of Chicago reported District farmland values for the first quarter of 2017 were unchanged.¹ However, Illinois and Indiana values declined 1% and 2%, respectively. Farmland values in Iowa and Wisconsin increased 1% and 2%, respectively. The Iowa Chapter of the Realtors® Land Institute reported Iowa had a state-wide increase of 0.9% for the September 2016

to March 2017 period. For the period of March 2016 to March 2017, farmland values were down 2.8%. The 2017 Purdue Farmland Value Survey² also contains a mixture of increases and decreases.

On a state-wide basis, year to year comparisons indicate top quality land remained steady (an increase of 0.2%), while average and poor quality farmland experienced modest declines of 1.6% and 1.4%, respectively (Table 1). This is a much different outcome than reported last year with a state-wide decline of 8.2% to 8.7% across farmland qualities. The 2017 changes in farmland values across

¹The Chicago District includes Iowa and Michigan, and parts of Wisconsin, Illinois, and Indiana.

²The Purdue Farmland Value Survey was first published in August 1974. Individuals surveyed include rural appraisers, commercial bank and Farm Credit Mid-America agricultural loan officers, FSA personnel, farm managers, and farmers. Survey results provide information about the general level and trend in farmland values and cash rents. It does not indicate the specific values for an individual farm.

Table 4. Average estimated Indiana cash rent per acre, (tillable, bare land) 2016 and 2017, Purdue Land Value Survey, June 2017

Area	Land Class	Corn bu./A	Rent/Acre		Change '16-'17 %	Rent/bu. of Corn		Rent as % of June Land Value	
			2016 \$/A	2017 \$/A		2016 \$/bu.	2017 \$/bu.	2016 %	2017 %
North	Top	203	260	249	-4.2%	1.29	1.23	3.2	3.0
	Average	171	202	205	1.5%	1.22	1.20	3.0	3.0
	Poor	139	148	159	7.4%	1.16	1.14	2.9	3.2
Northeast	Top	196	236	228	-3.4%	1.26	1.16	2.7	2.7
	Average	168	192	187	-2.6%	1.19	1.11	2.7	2.6
	Poor	134	150	150	0.0%	1.14	1.12	2.6	2.6
W. Central	Top	207	296	279	-5.7%	1.40	1.35	3.0	2.8
	Average	181	241	235	-2.5%	1.32	1.30	2.9	2.9
	Poor	154	193	193	0.0%	1.25	1.25	3.0	3.0
Central	Top	197	271	273	0.7%	1.37	1.39	3.0	3.1
	Average	167	221	220	-0.5%	1.30	1.32	2.9	2.9
	Poor	140	177	179	1.1%	1.24	1.28	3.0	3.1
Southwest	Top	208	273	257	-5.9%	1.36	1.24	3.0	2.8
	Average	165	210	194	-7.6%	1.29	1.18	3.0	2.8
	Poor	126	149	140	-6.0%	1.20	1.11	3.2	3.0
Southeast	Top	184	199	178	-10.6%	1.04	0.97	3.5	3.1
	Average	152	147	142	-3.4%	0.96	0.93	3.3	3.2
	Poor	124	111	106	-4.5%	1.00	0.85	3.3	3.2
Indiana	Top	200	257	253	-1.6%	1.30	1.27	3.0	3.0
	Average	169	204	205	0.5%	1.23	1.21	2.9	2.9
	Poor	139	157	163	3.8%	1.17	1.17	2.9	3.0

¹ The cash rent reported in this summary represents averages over several different locations and soil types. Determining an appropriate cash rent for a specific property requires more information than is contained in this report. You may also want to obtain advice from a professional that manages agricultural properties.

values will be higher in five years. This was 45% of the respondents. While this is the largest group, history indicates a 9.5% increase on farmland values is a very modest increase. A pessimist might combine these groups to say only 45% expect farmland value to be higher in five years, while 55% expect farmland values to be the same or lower. An optimist might combine these groups to say 74% expect farmland value to be the same or higher in five years, while only 26% expect farmland values to be lower

Combining all three groups for the next 5 years provides a 0.7% increase expected in five years. Time will tell which might be correct, but this year's survey does have

a significant number of respondents expecting higher farmland prices in five years.

Cash Rent

The 2015 survey was the first survey since 1999 to report a state-wide decline in cash rents across all land qualities. State-wide cash rents in 2015 declined 1.3% to 2.4%. In 2016, the survey found a state-wide decline in cash rents of 9.8% to 10.9%.

This year there were only modest changes in cash rents, (Table 4). For 2017, top land had a cash rent of \$253 per acre, a decline of 1.6%. Average quality land had a cash rent of \$205 per acre, an increase of 0.5%. Poor quality land had a cash rent of \$163 per acre, an increase of 3.8%.

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2019 INDIANA FARMLAND VALUES AND CASH RENTS SLIDE LOWER

CRAIG DOBBINS, PROFESSOR OF AGRICULTURAL ECONOMICS

What an adventure 2019 has been. After many unexpected events during the first half of the year, I'm hoping for something more normal during the second half of 2019. Who would have thought corn and soybean planting would extend into late June?

News reports about the farmland market during the first half of the year called attention to the ability of top quality farmland to retain its value, while lower quality land seemed to be weakening. But across all farmland qualities the limited supply of farmland for sale was pointed to as the primary reason for relative stability in farmland values. What is the situation and outlook in Indiana now?

Statewide the 2019 Purdue Farmland Value Survey indicates farmland values moved lower. June year-to-year farmland value comparisons indicate top quality farmland declined 5.3%, average quality

farmland declined 0.9%, and the poor quality farmland decline was so small it resulted in a 0.0% change (Table 1).

The change in top quality farmland for June 2018 to December 2018 accounted for the largest part of the farmland value change. Average and poor quality farmland values in this period had small increases, a 1.0% increase for average quality farmland and a 3.3% increase for poor quality farmland. During the December 2018 to June 2019 period, top quality farmland continued to decline. Declines in value for average and poor quality land were large enough to offset the gains in the first six months. Average quality farmland declined 1.8% and poor quality farmland declined 3.2%. For the June 2018 to June 2019 period, top quality farmland declined \$456 per acre, average quality farmland declined \$61 per acre and poor quality farmland declined by \$2 per acre.

1.4% decline in average quality farmland and a 1.2% decline in poor quality farmland.

Statewide top quality farmland had a cash rent of \$249 per acre, a reduction of \$12 per acre. Average quality land had a cash rent of \$207 per acre, a de-

cline of \$3 per acre. Poor quality land had a cash rent of \$166 per acre, a decline of \$2 per acre.

Comparing regional cash rent changes, a decline occurred for all land classes in the Northeast, West Central, Central, and Southwest. The Southwest re-

Table 4. Average estimated Indiana cash rent per acre, (tillable, bare land) 2018 and 2019, Purdue Land Value Survey, June 2019

Area	Land Class	Corn bu./A	Rent/Acre		Change '18-'19 %	Rent/bu. of Corn		Rent as % of June Land Value	
			2018 \$/A	2019 \$/A		2018 \$/bu.	2019 \$/bu.	2018 %	2019 %
			North	Top	201	263	263	0.0%	1.26
	Average	170	210	214	1.9%	1.21	1.26	2.9	3.1
	Poor	140	167	170	1.8%	1.20	1.21	3.2	3.4
Northeast	Top	195	233	226	-3.0%	1.21	1.16	2.8	3.0
	Average	169	192	189	-1.6%	1.16	1.12	2.8	2.8
	Poor	144	153	152	-0.7%	1.08	1.06	2.8	2.9
W. Central	Top	218	297	284	-4.4%	1.40	1.30	3.1	3.1
	Average	186	245	241	-1.6%	1.32	1.30	3.1	3.1
	Poor	156	199	195	-2.0%	1.29	1.25	3.2	3.1
Central	Top	204	273	251	-8.1%	1.34	1.23	3.0	2.9
	Average	181	228	219	-3.9%	1.30	1.21	3.0	2.9
	Poor	158	188	180	-4.3%	1.29	1.14	3.0	2.9
Southwest	Top	220	263	233	-11.4%	1.24	1.06	3.0	2.9
	Average	179	196	181	-7.7%	1.14	1.01	3.2	2.7
	Poor	144	143	134	-6.3%	1.10	0.93	3.5	3.0
Southeast	Top	193	186	189	1.6%	0.97	0.98	2.7	3.2
	Average	162	139	151	8.6%	0.91	0.93	2.6	3.3
	Poor	126	102	116	13.7%	0.89	0.92	2.7	3.5
Indiana	Top	204	261	249	-4.6%	1.28	1.22	3.0	3.0
	Average	175	210	207	-1.4%	1.21	1.18	3.0	3.0
	Poor	147	168	166	-1.2%	1.19	1.13	3.1	3.1

The cash rent reported in this summary represents averages over several different locations and soil types. Determining an appropriate cash rent for a specific property requires more information than is contained in this report. You may also want to obtain advice from a professional that manages agricultural properties.



PURDUE AGRICULTURAL ECONOMICS REPORT

Title: Indiana Farmland Prices Hit New Record High in 2021
Author: Todd H. Kuethe
Issue ID: PAER_2021-9
Date: July 27, 2021
Tags: Farmland values, cash rents
Summary: Indiana farmland prices hit a new record high in 2021. Farmland price growth is driven by a combination of high expected incomes, low interest rates, and limited supply to satisfy demand.

It is safe to say that the last year was unlike any other in recent memory. The COVID-19 pandemic caused significant disruption to our lives and the global economy. Surprisingly, many of the current economic forces put upward pressure on farmland prices. As one respondent noted, “short supply of farms for sale, investors and institutional buyers, farmers flush with money and equity, continued historic low interest rates and fear of increasing rates, an influx of government assistance, higher than anticipated commodity prices, fear of tax policy changes, and a willingness to accept lower required returns on investments... *all equal a new historic land value.*” This unique combination of economic forces led to new record high farmland prices in 2021, according to the recent *Purdue Land Values and Cash Rent Survey*.

Statewide, top quality farmland averaged \$9,785 per acre, up 14.1% from June 2020 (Table 1). The high growth rate for top quality farmland was closely followed by the growth in average and poor quality farmland prices, which increased by 12.5% (to \$8,144) and 12.1% (to \$6,441), respectively. Across all land quality classes, 2021 per acre farmland prices exceeded the previous record set in 2014.

Many areas of the state experienced particularly high farmland price appreciation (Figure 1). The highest growth rates were observed in the Southwest region, ranging from 20% for average and poor quality land to nearly 28% for top quality farmland. High appreciation rates were also observed across all land quality classes in the Central and West Central regions. The West Central and Central regions also exhibited the highest value or cost per unit of productivity (per bushel of corn). In 2021, the highest per acre price for high quality farmland was in the Southwest portion of the state, and the highest per acre prices for average and poor quality farmland were in the West Central region.

Cash Rents

Statewide cash rental rates increased across all land quality classes in 2021. Statewide average rental rates increased by 3.9% for top quality land, from \$259 to \$269 per acre. The cash rental rates for average and poor quality lands both increased by 4.6% to \$227 and \$183, respectively. At the regional level, the largest rental rate increases for top and average quality land were both in the Southeast region (11.5% and 6.4%), and the largest rental rate increases for poor quality land were in the North region (5.5%). Across all three land quality classes, the highest per acre cash rent was observed in the West Central region.

Rent as a share of June land value decreased slightly in 2021, suggesting that cash rental rates appreciated slower than farmland prices. Some portion of the difference in appreciation rates may reflect changes in expectations between fall 2020, when 2021 rents were negotiated, and the 2021 growing season. However, at least one respondent suggests that “fear of input prices for 2022 is going to restrict cash rents going up sharply” in the coming year.

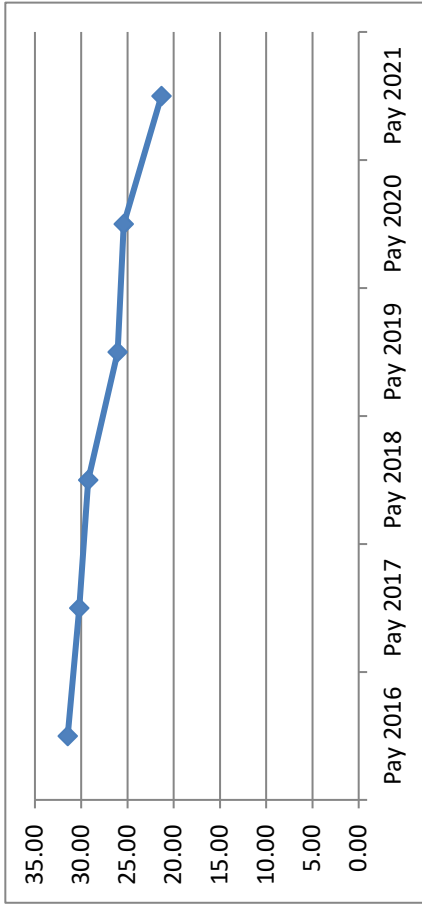
Table 4: Average estimated Indiana cash rent per acre, (tillable, bare land) 2020 and 2021, Purdue Land Value Survey, June 2021

Area	Land Class	Corn bu/A	Rent/Acre		Change 20-21 %	Rent/bu. of corn		Rent as % of June Land Value	
			2020 \$/A	2021 \$/A		2020 \$/bu.	2021 \$/bu.	2020 %	2021 %
North	Top	214	272	273	0.4%	1.31	1.28	3.2%	3.0%
	Average	178	219	222	1.4%	1.22	1.25	3.3%	3.1%
	Poor	146	165	174	5.5%	1.10	1.19	3.4%	3.1%
Northeast	Top	205	242	242	0.0%	1.20	1.18	2.8%	2.6%
	Average	178	205	211	2.9%	1.16	1.19	2.7%	2.6%
	Poor	152	174	181	4.0%	1.14	1.19	2.7%	2.7%
W. Central	Top	217	293	302	3.1%	1.35	1.39	3.1%	2.8%
	Average	193	252	262	4.0%	1.33	1.36	3.1%	2.8%
	Poor	165	212	222	4.7%	1.30	1.35	3.2%	2.8%
Central	Top	212	261	272	4.2%	1.24	1.28	3.0%	2.7%
	Average	186	222	235	5.9%	1.21	1.26	2.9%	2.6%
	Poor	160	185	192	3.8%	1.18	1.20	3.0%	2.6%
Southwest	Top	219	269	288	7.1%	1.27	1.32	2.9%	2.5%
	Average	180	216	225	4.2%	1.21	1.25	3.0%	2.6%
	Poor	145	161	164	1.9%	1.09	1.13	3.2%	2.7%
Southeast	Top	198	200	223	11.5%	1.06	1.13	3.3%	3.3%
	Average	167	171	182	6.4%	1.06	1.09	3.5%	3.6%
	Poor	133	131	133	1.5%	0.99	1.00	3.6%	3.6%
Indiana	Top	212	259	269	3.9%	1.27	1.27	3.0%	2.7%
	Average	182	217	227	4.6%	1.24	1.25	3.0%	2.8%
	Poor	153	175	183	4.6%	1.19	1.20	3.0%	2.8%

Looking Ahead

Statewide farmland prices established a new record high in 2021, expanding on the growth from 2019 to 2020. The growth in farmland prices is driven by complex combination of economic

Average Net Tax Bill/Acre of Farmland



January 1, 2022
Average Net Tax Bill/Acre of Farmland

Pay 2016	31.46
Pay 2017	30.22
Pay 2018	29.23
Pay 2019	26.05
Pay 2020	25.40
Pay 2021	21.33

January 1, 2022		Real	Operating		
		<u>Estate Loans</u>	<u>Loans</u>	<u>Avg.</u>	<u>Source:</u>
2016	Jan-Mar	4.65	4.91		P-28
	Apr-June	4.57	4.89		P-28
	July-Sept	4.57	4.87		P-28
	Oct-Dec	4.71	5.03		P-28
	Average	4.63	4.93	4.78	
2017	Jan-Mar	4.80	5.13		P-28
	Apr-June	4.86	5.20		P-28
	July-Sept	4.84	5.16		P-28
	Oct-Dec	4.93	5.34		P-28
	Average	4.86	5.21	5.04	
2018	Jan-Mar	5.14	5.53		P-30
	Apr-June	5.28	5.69		P-30
	July-Sept	5.46	5.86		P-30
	Oct-Dec	5.61	6.07		P-30
	Average	5.37	5.79	5.58	
2019	Jan-Mar	5.53	6.04		P-30
	Apr-June	5.39	5.98		P-30
	July-Sept	5.08	5.71		P-30
	Oct-Dec	4.97	5.49		P-30
	Average	5.24	5.81	5.53	
2020	Jan-Mar	4.51	4.83		P-32
	Apr-June	4.40	4.77		P-32
	July-Sept	4.24	4.65		P-32
	Oct-Dec	4.10	4.49		P-32
	Average	4.31	4.69	4.50	
2021	Jan-Mar	4.08	4.42		P-32
	Apr-June	4.02	4.40		P-32
	July-Sept	4.01	4.34		P-32
	Oct-Dec (1)	4.01	4.34		P-32
	Average	4.03	4.38	4.21	

Source: Federal Reserve Bank of Chicago.
AgLetter (a quarterly newsletter)

(1) - The information for the 4th quarter of 2021 was not available at the time of this publication so the 3rd quarter of 2021 was used.

AgLetter



FARMLAND VALUES AND CREDIT CONDITIONS

Summary

Farmland values in the Seventh Federal Reserve District had an annual increase of 1 percent for 2017, following three consecutive yearly declines. Values for “good” agricultural land in the fourth quarter of 2017 were overall unchanged from the third quarter, according to 185 survey respondents representing agricultural banks across the District. Just over three-fourths of the responding agricultural bankers expected farmland values to be stable during the January through March period of 2018.

Agricultural credit conditions in the District deteriorated once again in the fourth quarter of 2017. Repayment rates on non-real-estate farm loans were lower in the October through December period of 2017 than in the same period of 2016, and rates of loan renewals and extensions were higher—which indicated greater stress in the credit environment. Yet, for 2018, just 2.5 percent of farm loan customers were not anticipated to qualify for operating credit at the banks of the survey respondents. Non-real-estate loan demand in the fourth quarter of 2017 increased from a year ago, while funds available for lending were at nearly the same level as a year earlier. The average loan-to-deposit ratio for the District (76.6 percent) was up from a year ago. Average interest rates on farm loans crept up at the end of 2017, reaching levels similar to those of early 2012.

Farmland values

The District saw an annual increase of 1 percent in “good” farmland values for 2017, bucking the trend of annual declines suffered over the previous three years (see chart 1 on next page). With farmland values up slightly for 2017, the District avoided exceeding the three consecutive years of declines seen in 1984–86. In the fourth quarter of 2017, Indiana, Iowa, and Wisconsin had year-over-year increases in agricultural land values, while Illinois had a decrease (see table and map below). In addition, there were indications that Michigan experienced a year-over-year decline in farmland values for that quarter (however, too few bankers responded to report a numerical change). The District’s agricultural land values were overall the same in the fourth quarter of 2017 as in the third quarter; Wisconsin was the only District state with a quarterly increase in its agricultural land values.

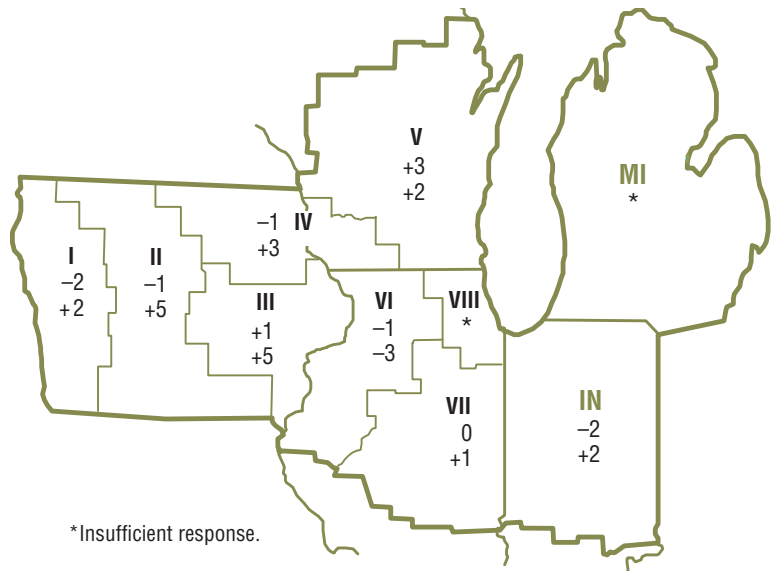
After adjusting for inflation, the District actually experienced an annual decrease of 1 percent in farmland values for 2017. While this was the fourth annual real decline in a row for District farmland values, in the 1980s there were seven consecutive years of real declines for such values. In real terms, there has been a 10 percent correction in the District’s farmland values from their peak in 2013 to the end of 2017 (see chart 2 on next page). Even so, the index of inflation-adjusted farmland values for the District was 58 percent higher in 2017 than at its previous peak in 1979.

Percent change in dollar value of “good” farmland

Top: October 1, 2017 to January 1, 2018

Bottom: January 1, 2017 to January 1, 2018

	October 1, 2017 to January 1, 2018	January 1, 2017 to January 1, 2018
Illinois	0	-1
Indiana	-2	+2
Iowa	0	+3
Michigan	*	*
Wisconsin	+2	+2
Seventh District	0	+1



Credit conditions at Seventh District agricultural banks

	Loan demand (index) ^b	Funds availability (index) ^b	Loan repayment rates (index) ^b	Average loan-to-deposit ratio (percent)	Interest rates on farm loans		
					Operating loans ^a (percent)	Feeder cattle ^a (percent)	Real estate ^a (percent)
2016							
Jan–Mar	156	105	32	73.3	4.91	5.01	4.65
Apr–June	126	108	48	72.6	4.89	5.05	4.57
July–Sept	132	103	48	75.3	4.87	4.95	4.57
Oct–Dec	114	105	65	75.0	5.03	5.10	4.71
2017							
Jan–Mar	129	101	57	74.4	5.13	5.27	4.80
Apr–June	119	104	68	74.4	5.20	5.25	4.86
July–Sept	120	95	60	77.4	5.16	5.25	4.84
Oct–Dec	128	99	53	76.6	5.34	5.44	4.93

^aAt end of period.

^bBankers responded to each item by indicating whether conditions in the current quarter were higher or lower than (or the same as) in the year-earlier quarter. The index numbers are computed by subtracting the percentage of bankers who responded “lower” from the percentage who responded “higher” and adding 100.

Note: Historical data on Seventh District agricultural credit conditions are available for download from the *AgLetter* webpage, <https://www.chicagofed.org/publications/agletter/index>.

for customers to qualify for non-real-estate farm loans during the October through December period of 2017 relative to the same period of a year ago, and none required smaller amounts. As of January 1, 2018, the average interest rates for farm operating loans (5.34 percent) and feeder cattle loans (5.44 percent) were at their highest levels since the first quarter of 2012. The average interest rate for agricultural real estate loans (4.93 percent) was last higher during a spike in the fourth quarter of 2013. However, after being adjusted for inflation with the Personal Consumption Expenditures Price Index, all these interest rates were at their lowest levels since the first quarter of 2017, as an uptick in inflation was higher than the increases in farm interest rates.

Agricultural operators demonstrated greater interest in non-real-estate loans during the October through December period of 2017 than during the same period of 2016. With 38 percent of survey respondents reporting an increase in the demand for non-real-estate loans and 10 percent reporting a decrease, the index of loan demand stood at 128 in the fourth quarter of 2017. For the second consecutive quarter, funds availability was below the level of a year ago in the fourth quarter of 2017. Nevertheless, the index of funds availability was up a bit at 99, with funds availability higher at 11 percent of the survey respondents’ banks and lower at 12 percent. Reflecting the changes in these indexes, the District’s average loan-to-deposit ratio was higher than a year ago; but at 76.6 percent, this ratio was still 4.4 percentage points below the average level desired by the responding bankers.

Looking forward

Given the challenging times facing agriculture, it’s not surprising that an Iowa respondent stated, “Several area banks are putting pressure on producers with tight margins to either sell land or refinance with another bank.” More surprisingly, survey respondents indicated that only 2.5 percent (a shade lower than a year ago) of their farm customers with operating credit in 2017 were not likely to qualify for

new operating credit in 2018; however, this proportion was 4.9 percent in Michigan and 3.2 percent in Wisconsin. Responding bankers expected non-real-estate agricultural loan volumes to be higher in the first quarter of 2018 relative to the same quarter of a year earlier, as volumes for operating loans and loans guaranteed by the USDA’s Farm Service Agency were forecasted to be higher. However, volumes for grain storage, farm machinery, feeder cattle, and dairy loans were forecasted to be lower in the January through March period of 2018 relative to the same period of 2017. In line with these lower loan volumes, as of the start of 2018, the majority of survey respondents anticipated capital expenditures by farmers would be lower in the year ahead compared with the year just ended (for the fifth year in a row).

The vast majority of responding bankers (76 percent) expected farmland values to be stable in the first quarter of 2018, while 23 percent expected them to decline and only 1 percent expected them to rise. So, more of the same is likely for District agricultural land values in early 2018.

David B. Oppedahl, *senior business economist*

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AgLetter



FARMLAND VALUES AND CREDIT CONDITIONS

Summary

Respondents to the Chicago Fed’s agricultural survey covering the fourth quarter of 2019 sounded more optimistic than a year ago, even though the results for farmland values mirrored those from the fourth quarter of 2018. On balance, the Seventh Federal Reserve District saw no annual change in its agricultural land values in 2019. Yet, values for “good” farmland in the fourth quarter of 2019 were up 1 percent from the third quarter, according to 142 survey respondents representing agricultural banks across the District. Eighty-two percent of the survey respondents expected farmland values to be stable during the January through March period of 2020, but 7 percent expected them to rise during the first quarter of 2020—a little less than the 11 percent who expected them to decline.

The District’s agricultural credit conditions showed some signs of improvement in the fourth quarter of 2019. A slightly smaller percentage (2.2 percent) of current agricultural borrowers were not likely to qualify for operating credit at the survey respondents’ banks in 2020 than in 2019. Also, the index of repayment rates on non-real-estate farm loans for the October through December period of 2019 reached its highest level since the third quarter of 2014. Non-real-estate loan demand in the fourth quarter of 2019

was above the previous year’s level, as were funds available for lending by survey respondents’ banks. The average loan-to-deposit ratio for the District was 78.9 percent in the fourth quarter of 2019—almost identical to the average of a year ago. Average interest rates on farm operating, feeder cattle, and farm real estate loans had moved down by the end of 2019 to levels not seen since the end of 2017.

Farmland values

On the whole, there was no annual change in “good” agricultural land values in the District for 2019; that is, the District’s farmland values in the fourth quarter of 2019 were essentially the same as a year ago (see table and map below). In the fourth quarter of 2019, Indiana and Iowa experienced year-over-year increases in agricultural land values of 2 percent, whereas Illinois and Wisconsin experienced decreases of 1 percent and 2 percent, respectively. (Compared with a year ago, Michigan farmland values seemed to be flat, yet not enough Michigan bankers responded to provide a conclusive result.) The District’s farmland values increased 1 percent in the fourth quarter of 2019 relative to the third quarter.

With inflation taken into account, District farmland values had a yearly decrease of a little over 1 percent in 2019; in real terms, the decrease in 2019 was smaller than the one in 2018 because of a dip in inflation (see chart 1 on next page). This was the sixth straight annual real decline.

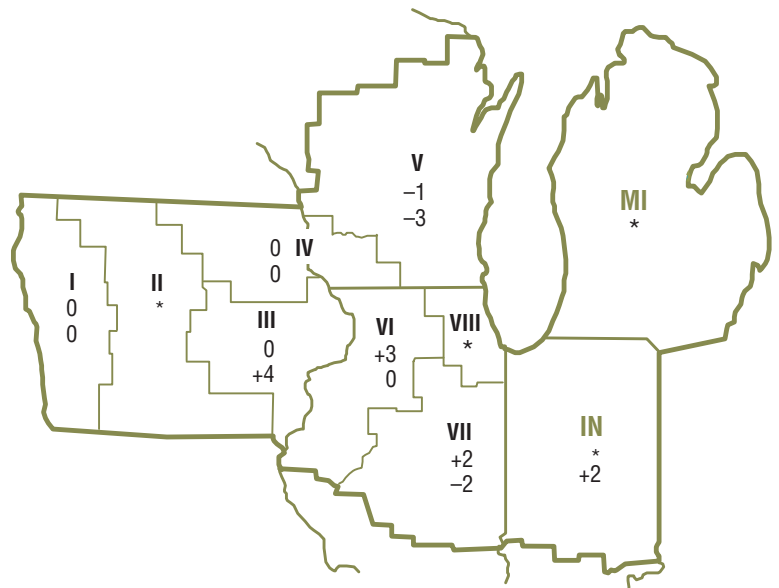
Percent change in dollar value of “good” farmland

Top: October 1, 2019 to January 1, 2020

Bottom: January 1, 2019 to January 1, 2020

	October 1, 2019 to January 1, 2020	January 1, 2019 to January 1, 2020
Illinois	+2	-1
Indiana	*	+2
Iowa	-1	+2
Michigan	*	*
Wisconsin	0	-2
Seventh District	+1	0

*Insufficient response.



Credit conditions at Seventh District agricultural banks

	Loan demand (index) ^b	Funds availability (index) ^b	Loan repayment rates (index) ^b	Average loan-to-deposit ratio (percent)	Interest rates on farm loans		
					Operating loans ^a (percent)	Feeder cattle ^a (percent)	Real estate ^a (percent)
2018							
Jan–Mar	130	97	53	75.6	5.53	5.62	5.14
Apr–June	123	91	64	77.4	5.69	5.75	5.28
July–Sept	128	82	63	79.4	5.86	5.93	5.46
Oct–Dec	135	88	59	79.0	6.07	6.13	5.61
2019							
Jan–Mar	141	86	52	78.6	6.04	6.11	5.53
Apr–June	119	93	74	80.2	5.98	6.14	5.39
July–Sept	115	103	70	78.8	5.71	5.77	5.08
Oct–Dec	117	107	79	78.9	5.49	5.61	4.97

^aAt end of period.

^bBankers responded to each item by indicating whether conditions in the current quarter were higher or lower than (or the same as) in the year-earlier quarter. The index numbers are computed by subtracting the percentage of bankers who responded “lower” from the percentage who responded “higher” and adding 100.

Note: Historical data on Seventh District agricultural credit conditions are available online, <https://www.chicagofed.org/publications/agletter/index>.

Funds availability was above the level of a year ago for the second quarter in a row. The index of funds availability edged up to 107 (its highest value since the second quarter of 2016) in the final quarter of 2019, with funds availability higher than a year ago at 15 percent of the survey respondents’ banks and lower at 8 percent. The District’s average loan-to-deposit ratio was almost the same as a year earlier; but at 78.9 percent, this ratio was still 3.9 percentage points below the average level desired by the responding bankers.

As of January 1, 2020, the average interest rates for farm operating loans (5.49 percent), feeder cattle loans (5.61 percent), and agricultural real estate loans (4.97 percent) were at their lowest levels since the end of the fourth quarter of 2017. While interest rates moved down, 34 percent of the survey respondents reported their banks tightened credit standards for agricultural loans in the fourth quarter of 2019 relative to the fourth quarter of 2018, and 66 percent reported the credit standards at their banks remained essentially unchanged. Similarly, 17 percent of responding bankers noted that their banks required larger amounts of collateral for customers to qualify for non-real-estate farm loans during the October through December period of 2019 relative to the same period of a year ago, and none required smaller amounts.

Looking forward

The survey results reflected some cautious optimism about agriculture’s prospects in 2020. Survey respondents indicated that at the beginning of 2020, only 2.2 percent of their farm customers with operating credit in the year just past were not likely to qualify for new operating credit in the year ahead—this was a slight improvement from what was reported at the start of 2019. Farm real estate loans were predicted to have greater volumes in the first three months of 2020 compared with the same three months of a year ago. Likewise, responding bankers expected non-real-estate agricultural loan volumes to be higher in the first quarter of 2020 relative to the same quarter of a year earlier, as volumes for operating

loans and loans guaranteed by the FSA were forecasted to grow. At the start of 2020, survey respondents who anticipated capital expenditures by farmers would be lower in the year ahead compared with the year just ended still outnumbered survey respondents who anticipated higher capital expenditures; yet those projecting lower capital expenditures no longer made up a majority (there was a sizable share expecting no change in capital spending by farmers). As one Wisconsin banker stated, “Due to a recent increase in milk prices, I expect to see an uptick in capital investment that was put on hold over the last five years.”

The vast majority of responding bankers (82 percent) expected farmland values to be stable in the first quarter of 2020. Notably, the share of respondents expecting farmland values to drop (11 percent) was not much larger than the share of respondents expecting them to climb (7 percent)—in contrast with the pattern seen over the past six years or so. Hence, District agricultural land values will probably be steady in the first quarter of 2020.

David B. Oppedahl, *senior business economist*

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AgLetter



FARMLAND VALUES AND CREDIT CONDITIONS

Summary

Agricultural land values for the Seventh Federal Reserve District surged 18 percent in the third quarter of 2021 from a year ago. Moreover, values for “good” farmland in the District overall were 6 percent higher in the third quarter of 2021 than in the second quarter, according to the 151 bankers who responded to the October 1 survey. Most survey respondents (68 percent) anticipated the District’s farmland values to go up again during the fourth quarter of 2021, while the rest anticipated stable District farmland values in the final quarter of this year (none anticipated them to go down).

The District’s agricultural credit conditions were better in the third quarter of 2021 than a year earlier. Repayment rates for non-real-estate farm loans were higher relative to the same quarter of the previous year for the fourth consecutive quarter (accompanied by lower loan renewals and extensions). In the third quarter of this year, the availability of funds for lending by agricultural banks was again higher than a year ago, even as the demand for non-real-estate farm loans remained lower than a year earlier for the fifth consecutive quarter. The average loan-to-deposit ratio for the District was 68.8 percent in the third quarter of 2021. Average interest rates on agricultural loans—in both nominal and real terms—kept falling during the third quarter of 2021.

Biofuels in the Midwest: Today and Tomorrow

On November 30, 2021, the Federal Reserve Bank of Chicago will hold a virtual event to explore the impacts of biofuels on the Midwest and related trends in agriculture. Registration is available online, <https://www.chicagofed.org/events/2021/ag-conference>.

Farmland values

Assisted by low interest rates, government support, and higher than normal farm incomes, the District saw a year-over-year gain of 18 percent in its agricultural land values in the third quarter of 2021. This was the largest year-over-year increase in the District’s farmland values in nine and a half years. Iowa led the way with a year-over-year jump in farmland values of 28 percent; other District states also saw double-digit year-over-year growth in farmland values (see map and table below). After being adjusted for inflation with the Personal Consumption Expenditures Price Index (PCEPI), District farmland values were still up 13 percent in the third quarter of 2021 relative to a year ago (see chart 1 on next page). In nominal terms, the District’s agricultural land values in the third quarter of 2021 were 6 percent higher than in the second quarter.

Although drought threatened a substantial portion of the Midwest over the summer, District-wide corn and soybean yields in 2021 rebounded strongly from 2020 and

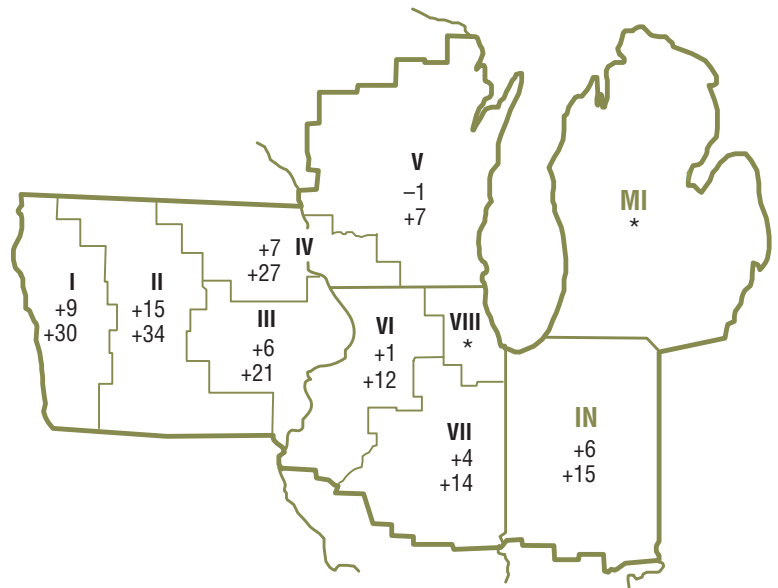
Percent change in dollar value of “good” farmland

Top: July 1, 2021 to October 1, 2021

Bottom: October 1, 2020 to October 1, 2021

	July 1, 2021 to October 1, 2021	October 1, 2020 to October 1, 2021
Illinois	+3	+13
Indiana	+6	+15
Iowa	+10	+28
Michigan	*	*
Wisconsin	+1	+10
Seventh District	+6	+18

*Insufficient response.



Credit conditions at Seventh District agricultural banks

	Loan demand (index) ^b	Funds availability (index) ^b	Loan repayment rates (index) ^b	Average loan-to-deposit ratio (percent)	Interest rates on farm loans		
					Operating loans ^a (percent)	Feeder cattle ^a (percent)	Real estate ^a (percent)
2020							
Jan–Mar	117	107	59	78.9	4.83	5.01	4.51
Apr–June	103	119	64	77.6	4.77	4.94	4.40
July–Sept	85	131	93	75.0	4.65	4.79	4.24
Oct–Dec	91	148	133	73.6	4.49	4.66	4.10
2021							
Jan–Mar	79	162	146	69.7	4.42	4.58	4.08
Apr–June	63	160	146	67.5	4.40	4.55	4.02
July–Sept	78	161	143	68.8	4.34	4.51	4.01

^aAt end of period.

^bBankers responded to each item by indicating whether conditions in the current quarter were higher or lower than (or the same as) in the year-earlier quarter. The index numbers are computed by subtracting the percentage of bankers who responded “lower” from the percentage who responded “higher” and adding 100.

Note: Historical data on Seventh District agricultural credit conditions are available online, <https://www.chicagofed.org/publications/agletter/index>.

moreover, 87 percent of the survey respondents stated that their respective banks were below their targeted levels. As of October 1, 2021, the District’s average nominal interest rates on new operating loans, feeder cattle loans, and farm real estate loans were at their lowest levels on record: 4.34 percent, 4.51 percent, and 4.01 percent, respectively. Furthermore, when adjusted for inflation using the PCEPI, the average interest rate for farm real estate loans dipped below zero for the first time since the first quarter of 1975.

Looking forward

Sixty-eight percent of survey respondents anticipated District farmland values to rise in the final quarter of 2021, and the rest (32 percent) anticipated them to be stable. In addition, a large majority of respondents expected both farmers and nonfarm investors to have stronger rather than weaker demand to acquire farmland this fall and winter compared with a year earlier. Also, respondents overwhelmingly anticipated a rise in the volume of farmland transfers during this fall and winter relative to a year ago.

Illustrating agriculture’s much-improved situation from last year, net cash earnings (which include government payments) for crop, cattle, and hog farmers were expected to be up during the fall and winter from their levels of a year earlier, according to the responding bankers. For crop farmers, 85 percent of survey respondents forecasted net cash earnings to increase over the next three to six months relative to a year ago, and 5 percent forecasted these earnings to decrease. For cattle and hog farmers, 34 percent of survey respondents expected net cash earnings to increase over the next three to six months relative to a year ago, and 13 percent expected these earnings to decrease. Yet, the District’s dairy industry was not anticipated to fare as well, with 13 percent of responding bankers forecasting higher net cash earnings over the next three to six months relative to a year earlier and 21 percent forecasting lower such earnings.

By a wide margin the survey respondents forecasted loan repayment rates to rise rather than drop this fall and winter from a year ago: 59 percent of the responding bankers predicted a higher volume of farm loan repayments over the next three to six months compared with a year earlier, while only 1 percent predicted a lower volume. In addition, forced sales or liquidations of farm assets owned by financially distressed farmers were expected to decrease in the next three to six months relative to a year ago, according to 59 percent of the responding bankers (only 1 percent expected them to increase). On the whole, the non-real-estate farm loan volume of the survey respondents’ banks in the October through December period of 2021 was anticipated to be somewhat lower than in the same period of 2020, whereas the volume of farm real estate loans was anticipated to be higher.

An Iowa banker noted that 2021 had “given most farm customers their best returns to income in years,” but added that “concern will shift next year to higher input costs and high land prices.”

David B. Oppedahl, *senior business economist*

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Income Approach: November, Annual Average, & Marketing Year Average Prices

Line #	Column	A 2016		B 2016		C 2017		D 2017		E 2018		F 2018		G 2019		H 2019		I 2020		J 2020		K 2021		Source or Formula:
		Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans	
1	Yield	173	57.5	180	54	189	57.5	169	51	187	58	189	57	187	51	187	58	187	51	187	58	189	57	IASS - Crop Summary
2	Price - November	3.44	9.64	3.32	9.41	3.49	8.60	3.92	8.94	3.82	10.30	4.97	11.90	3.82	8.94	3.82	10.30	4.97	11.90	3.82	10.30	4.97	11.90	IASS - Crop Prices
3	Price - Annual Avg.	3.78	9.71	3.63	9.63	3.63	9.44	3.98	8.78	3.75	9.27	5.37	12.99	3.75	8.78	3.75	9.27	5.37	12.99	3.75	9.27	5.37	12.99	DLGF Calculation
4	Price - Market Avg.	3.92	9.16	3.63	9.69	3.56	9.61	3.78	8.73	3.84	8.92	4.45	11.10	3.84	8.73	3.84	8.92	4.45	11.10	3.84	8.92	4.45	11.10	IASS - Crop Prices
5	GI - November	595.12	554.30	597.60	508.14	659.61	494.50	662.48	455.94	714.34	597.40	939.33	678.30	714.34	455.94	714.34	597.40	939.33	678.30	714.34	597.40	939.33	678.30	Line 1 times Line 2
6	GI - Annual Avg.	653.94	558.33	653.40	520.02	686.07	542.80	672.62	447.78	701.25	537.66	1014.93	740.43	701.25	447.78	701.25	537.66	1014.93	740.43	701.25	537.66	1014.93	740.43	Line 1 times Line 3
7	GI - Market Avg.	678.16	526.70	653.40	523.26	672.84	552.58	638.82	445.23	718.08	517.36	841.05	632.70	718.08	445.23	718.08	517.36	841.05	632.70	718.08	517.36	841.05	632.70	Line 1 times Line 4
8	AA v Nov	58.82	4.02	55.80	11.88	26.46	48.30	10.14	-8.16	-13.09	-59.74	75.60	62.13	-13.09	-8.16	-13.09	-59.74	75.60	62.13	-13.09	-59.74	75.60	62.13	Line 6 minus Line 5
9	MA v Nov	83.04	-27.60	55.80	15.12	13.23	58.07	-23.66	-10.71	3.74	-80.04	-98.28	-45.60	3.74	-10.71	3.74	-80.04	-98.28	-45.60	3.74	-80.04	-98.28	-45.60	Line 7 minus Line 5
10	NRTL - November	55		7		27		11		160		289		11		160		289		160		289		DLGF Calculation
11	NRTL - Annual Avg	86		41		64		12		124		358		12		124		358		124		358		Line 10 + or - Avg. Line 8
12	NRTL - Market Avg	83		42		63		-6		122		217		-6		122		217		122		217		Line 10 + or - Avg. Line 9
13	NRTL Average	75		30		51		6		135		288		6		135		288		135		288		Average Lines 10, 11, & 12
14	FRBC RE Rate	0.0463		0.0486		0.0537		0.0524		0.0431		0.0403		0.0524		0.0431		0.0403		0.0431		0.0403		Fed. Res. Bank of Chicago
15	FRBC OP Rate	0.0493		0.0521		0.0579		0.0581		0.0469		0.0438		0.0581		0.0469		0.0438		0.0469		0.0438		Fed. Res. Bank of Chicago
16	Avg. FRBC Rate	0.0478		0.0504		0.0558		0.0553		0.0450		0.0421		0.0553		0.0450		0.0421		0.0450		0.0421		Average Lines 14 & 15
17	Operating Market Value In Use	1,569		595		914		108		3,000		6,841		108		3,000		6,841		3,000		6,841		Line 13 / Line 16

NRTL = Net Return To Land
FRBC = Federal Reserve Bank of Chicago

Sources: (pages references within this packet)

	2016	2017	2018	2019	2020	2021
1 Yield	P-35	P-35	P-35	P-35	P-35	P-35
2 Price - November	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41
3 Price - Annual Avg.	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41
4 Price - Market Avg.	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41
10 NRTL - November	P-34 Line 12	P-34 Line 12	P-34 Line 12	P-34 Line 12	P-34 Line 12	P-34 Line 12
14 FRBC RE Rate	P-26	P-26	P-26	P-26	P-26	P-26
15 FRBC OP Rate	P-26	P-26	P-26	P-26	P-26	P-26
16 Avg. FRBC Rate	P-26	P-26	P-26	P-26	P-26	P-26

Line #	Doster/Huie -Table 1 Updated - December, 2021	A 2016		B 2016		C 2017		D 2017		E 2018		F 2018		G 2019		H 2019		I 2020		J 2020		K 2021		L 2021	Source of Information		
		Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans				
1	Yield per Acre	173	57.5	180	54	189	57.5	169	51	187	58	189	57	189	57	189	57	189	57	189	57	189	57	189	57	IN Ag. Stats. Service	
2	Price per Bu. - November	3.44	9.64	3.32	9.41	3.49	8.60	3.92	8.94	3.82	10.30	4.97	11.90	4.97	11.90	4.97	11.90	4.97	11.90	4.97	11.90	4.97	11.90	4.97	11.90	IN Ag. Stats. Service	
3	Sales	595	554	598	508	660	495	662	456	714	597	939	678	939	678	939	678	939	678	939	678	939	678	939	678	Line 1 X Line 2	
4	Less Variable Costs	399	203	422	232	435	255	447	245	418	235	424	243	424	243	424	243	424	243	424	243	424	243	424	243	Purdue Crop Guide	
5	Contribution Margin	196	351	176	276	225	240	215	211	215	362	515	435	515	435	515	435	515	435	515	435	515	435	515	435	Line 3 - Line 4	
6	Plus Government Pymt.	50		30		40		68		102		57		102		57		102		57		57		57		IN Ag. Stats. Service	
7	Total Contribution Margin	299		241		252		247		380		504		380		504		380		504		504		504		Lines 5 + 6 / 2	
8	Less Overhead:																										
9	Annual Machinery		122		123		130		130		130		130		130		130		130		130		130		130	Purdue Crop Guide	
10	Drying/Handling		91		81		66		80		65		64		80		65		65		65		64		64	Purdue Crop Guide	
11	Real Estate Tax		31		30		29		26		25		21		26		25		25		25		21		21	Purdue Crop Guide	
12	Net Return To Land - Nov.		55		7		27		11		160		289		11		160		160		160		289		289	Line 7 - 8,9,10, 11	
1	Yield per Acre			2016	2017	2018	2019	2020	2020	2020	2020	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	
2	Price per Bu. - November			P-35	P-35	P-35	P-35	P-35	P-35	P-35	P-35	P-35	P-35	P-35	P-35	P-35	P-35	P-35	P-35	P-35	P-35	P-35	P-35	P-35	P-35	P-35	IN Ag. Stats. Service
4	Less Variable Costs			P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41	P-40 & 41	IN Ag. Stats. Service	
6	Plus Government Pymt.			P-45	P-48	P-51	P-54	P-57	P-54	P-57	P-57	P-60	P-60	P-60	P-60	P-60	P-60	P-60	P-60	P-60	P-60	P-60	P-60	P-60	P-60	Purdue Crop Guide	
8	Annual Machinery			P-63	P-63	P-63	P-63	P-63	P-63	P-63	P-63	P-63	P-63	P-63	P-63	P-63	P-63	P-63	P-63	P-63	P-63	P-63	P-63	P-63	P-63	IN Ag. Stats. Service	
9	Drying/Handling			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Purdue Crop Guide
10	Family/Hired Labor			P-47	P-50	P-53	P-56	P-59	P-56	P-59	P-59	P-62	P-62	P-62	P-62	P-62	P-62	P-62	P-62	P-62	P-62	P-62	P-62	P-62	P-62	Purdue Crop Guide	
11	Real Estate Tax			P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	Purdue Crop Guide
				P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	P-25	DLGF Study

Sources: (pages references within this packet)

Foundation for Calculation: Doster/Huie Publication titled "A Method for Assessing Indiana Cropland-An Income Approach to Value" dated June 24, 1999
(See P-10 thru P-14 with emphasis on Table 1 found on P-13)

Indiana Corn Yields:

1985	123
1986	122
1987	135
1988	83
1989	133
1990	129
1991	92
1992	147
1993	132
1994	144
1995	113
1996	123
1997	122
1998	137
1999	132
2000	146
2001	156
2002	121
2003	146
2004	168
2005	154
2006	157
2007	154
2008	160
2009	171
2010	157
2011	146
2012	99
2013	177
2014	188
2015	150

2016	173	P-36
2017	180	P-36
2018	189	P-36
2019	169	P-36
2020	187	P-36
2021	189	P-37

Indiana Soybean Yields:

1985	41.5
1986	37
1987	40
1988	27.5
1989	36.5
1990	41
1991	39
1992	43
1993	46
1994	47
1995	39.5
1996	38
1997	43.5
1998	42
1999	39
2000	46
2001	49
2002	41.5
2003	38
2004	51.5
2005	49
2006	50
2007	46
2008	45
2009	49
2010	48.5
2011	45.5
2012	44
2013	51.5
2014	55.5
2015	50

2016	57.5	P-38
2017	54	P-38
2018	57.5	P-38
2019	51	P-38
2020	58	P-38
2021	57	P-39

Source: Indiana Agricultural Statistics Service

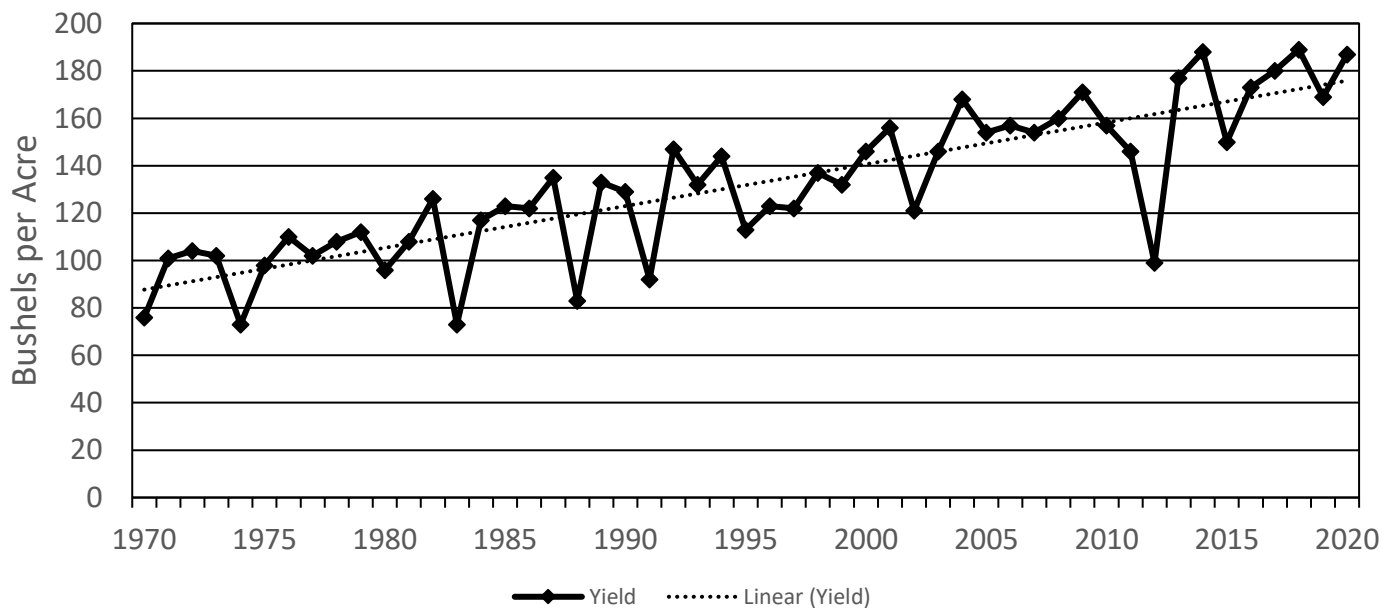
CROP SUMMARY

CORN FORECAST AND FINAL YIELD INDIANA, 1997-2020

Year	August Forecast	September Forecast	October Forecast	November Forecast	Final Yield Per Acre
	Yield (Bu)	Yield (Bu)	Yield (Bu)	Yield (Bu)	(Bushels)
1997	127	122	120	120	122
1998	136	139	137	137	137
1999	130	128	128	130	132
2000	155	155	151	147	146
2001	147	152	160	160	156
2002	124	119	117	117	121
2003	144	145	148	150	146
2004	156	157	167	169	168
2005	145	149	149	151	154
2006	167	167	165	159	157
2007	157	160	158	158	154
2008	164	162	160	160	160
2009	163	163	166	166	171
2010	176	170	160	160	157
2011	150	145	145	145	146
2012	100	100	100	100	99
2013	166	166	(¹)	174	177
2014	179	184	186	186	188
2015	158	156	156	156	150
2016	187	185	177	177	173
2017	173	171	173	181	180
2018	186	192	194	194	189
2019	166	161	162	165	169
2020	188	186	189	189	187

¹ Data not available due to sequestration.

Corn Yield Trend Indiana, 1970-2020





Quick Stats

Program	Year	Period	Week Ending	Geo Level	State	State ANSI	Ag District	Ag District Code	County	County ANSI	Zip Code	Region	watershed_code	Watershed	Commodity	Data Item	Domain	Domain Category	Value	CV (%)
SURVEY	2021	YEAR		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	189	
SURVEY	2021	YEAR - AUG FORECAST		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	194	
SURVEY	2021	YEAR - NOV FORECAST		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	189	
SURVEY	2021	YEAR - OCT FORECAST		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	194	
SURVEY	2021	YEAR - SEP FORECAST		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	197	

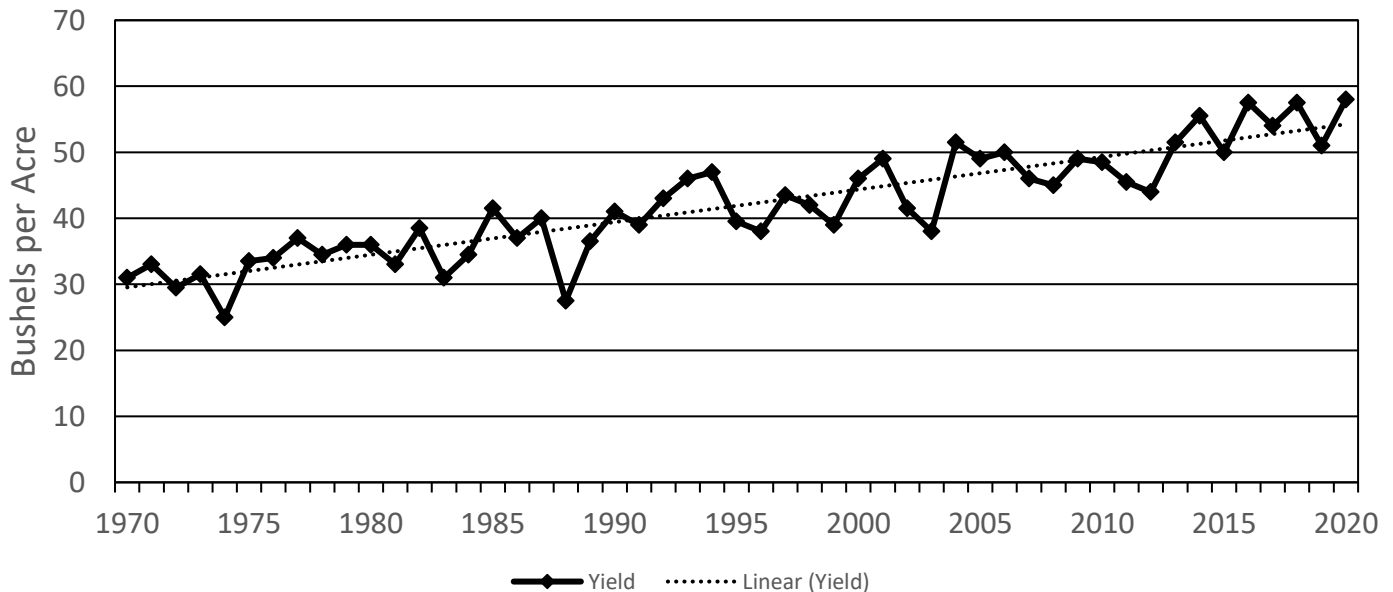
CROP SUMMARY

SOYBEAN FORECAST AND FINAL YIELD INDIANA, 1997-2020

Year	August Forecast Yield (Bu)	September Forecast Yield (Bu)	October Forecast Yield (Bu)	November Forecast Yield (Bu)	Final Yield Per Acre (Bushels)
1997	44.0	42.0	42.0	44.0	43.5
1998	45.0	45.0	42.0	42.0	42.0
1999	41.0	40.0	39.0	38.0	39.0
2000	46.0	46.0	46.0	46.0	46.0
2001	46.0	48.0	49.0	49.0	49.0
2002	41.0	41.0	40.0	41.0	41.5
2003	43.0	43.0	40.0	38.0	38.0
2004	45.0	45.0	51.0	53.0	51.5
2005	46.0	45.0	46.0	48.0	49.0
2006	49.0	50.0	51.0	51.0	50.0
2007	47.0	43.0	43.0	44.0	46.0
2008	46.0	43.0	42.0	44.0	45.0
2009	45.0	43.0	43.0	46.0	49.0
2010	49.0	50.0	50.0	50.0	48.5
2011	43.0	42.0	42.0	42.0	45.5
2012	37.0	37.0	41.0	44.0	44.0
2013	50.0	48.0	(¹)	50.0	51.5
2014	51.0	52.0	54.0	54.0	55.5
2015	49.0	50.0	51.0	51.0	50.0
2016	55.0	58.0	59.0	59.0	57.5
2017	55.0	56.0	55.0	55.0	54.0
2018	58.0	60.0	60.0	60.0	57.5
2019	50.0	49.0	48.0	49.0	51.0
2020	61.0	60.0	60.0	58.0	58.0

¹ Data not available due to sequestration.

Soybean Yield Trend Indiana, 1970-2020





Quick Stats

Program	Year	Period	Week Ending	Geo Level	State	State ANSI	Ag District	Ag District Code	County	County ANSI	Zip Code	Region	watershed_code	Watershed	Commodity	Data Item	Domain	Domain Category	Value	CV (%)
SURVEY	2021	YEAR		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	57	
SURVEY	2021	YEAR - AUG FORECAST		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	60	
SURVEY	2021	YEAR - NOV FORECAST		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	57	
SURVEY	2021	YEAR - OCT FORECAST		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	60	
SURVEY	2021	YEAR - SEP FORECAST		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	60	

Corn Prices

Source: Indiana Agricultural Statistics

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual Average	Marketing Average *
2000	1.97	2.06	2.08	2.15	2.15	1.95	1.65	1.63	1.67	1.75	1.83	2.06	1.91	1.88
2001	2.03	2.01	2.02	1.98	1.95	1.84	1.97	2.01	1.93	1.83	1.83	1.92	1.94	1.90
2002	1.98	1.99	1.91	1.91	2.05	2.07	2.25	2.58	2.55	2.38	2.41	2.43	2.21	1.98
2003	2.42	2.44	2.44	2.47	2.49	2.44	2.28	2.25	2.27	2.15	2.25	2.46	2.36	2.41
2004	2.50	2.75	2.96	3.07	3.08	2.80	2.57	2.44	2.07	1.88	1.81	1.95	2.49	2.53
2005	2.09	2.01	2.01	1.96	2.02	2.07	2.20	1.97	1.80	1.72	1.71	2.04	1.97	1.99
2006	2.09	2.07	2.15	2.20	2.26	2.21	2.31	2.08	2.32	2.70	3.03	3.23	2.39	2.00
2007	3.16	3.53	3.64	3.54	3.65	3.73	3.36	3.27	3.32	3.34	3.68	4.07	3.52	3.17
2008	4.23	4.67	4.96	5.49	5.82	5.89	5.92	5.67	4.73	4.15	4.04	4.14	4.98	4.39
2009	4.46	4.06	3.92	4.11	4.12	4.14	3.64	3.45	3.31	3.70	3.66	3.62	3.85	4.10
2010	3.79	3.69	3.62	3.51	3.65	3.55	3.69	3.80	4.24	4.50	4.82	4.94	3.98	3.66
2011	4.95	5.78	5.80	6.71	6.62	6.82	7.04	7.18	6.14	5.89	5.94	6.02	6.24	5.38
2012	6.21	6.46	6.59	6.56	6.52	6.55	7.43	7.92	7.37	7.22	7.43	7.27	6.96	6.31
2013	7.26	7.38	7.48	7.12	7.16	7.15	6.71	6.38	5.11	4.34	4.17	4.37	6.22	7.23
2014	4.49	4.48	4.68	4.86	4.91	4.63	4.07	3.88	3.59	3.48	3.54	3.80	4.20	4.47
2015	3.86	3.93	3.94	3.84	3.74	3.67	4.03	3.90	3.85	3.87	3.97	3.88	3.87	3.75
2016	3.97	3.92	3.93	3.97	4.09	4.26	3.89	3.54	3.41	3.40	3.44	3.57	3.78	3.92
2017	3.64	3.73	3.77	3.77	3.79	3.84	3.86	3.64	3.42	3.38	3.32	3.42	3.63	3.63
2018	3.54	3.59	3.72	3.80	3.92	3.81	3.60	3.54	3.45	3.44	3.49	3.70	3.63	3.56
2019	3.76	3.79	3.75	3.68	3.81	4.28	4.55	4.27	3.96	4.01	3.92	4.00	3.98	3.78
2020	4.10	4.04	4.03	3.61	3.43	3.41	3.51	3.48	3.77	3.73	3.82	4.06	3.75	3.84
2021	4.32	4.74	4.95	5.39	5.87	6.32	6.22	6.39	5.28	4.97	4.97	4.97	5.37	4.45

*Marketing average is September of the previous year to August in the current year.

Source: Pages 42 & 43 of this packet

Note: November & December 2021 Prices were not available at the time this calculation was made so the October 2021 price was carried over.

Soybean Prices
Source: Indiana Agricultural Statistics

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual Average	Marketing Average *
2000	4.65	4.90	5.06	5.18	5.27	5.11	4.62	4.63	4.71	4.51	4.57	4.93	4.85	4.71
2001	4.74	4.53	4.52	4.25	4.43	4.62	4.98	5.15	4.60	4.17	4.18	4.25	4.54	4.61
2002	4.29	4.34	4.56	4.63	4.79	5.05	5.51	5.67	5.53	5.24	5.53	5.61	5.06	4.42
2003	5.62	5.69	5.70	5.92	6.28	6.15	5.87	5.84	6.49	6.90	7.25	7.44	6.26	5.55
2004	7.38	8.38	9.43	9.76	9.62	9.45	8.89	7.18	5.51	5.24	5.22	5.47	7.63	7.67
2005	5.57	5.46	6.02	5.99	6.32	6.76	6.93	6.29	5.76	5.60	5.58	6.01	6.02	5.66
2006	6.06	5.83	5.76	5.69	5.83	5.80	5.85	5.53	5.40	5.63	6.13	6.38	5.82	5.78
2007	6.44	6.95	7.17	7.13	7.36	7.83	7.97	8.03	8.49	8.81	9.65	10.30	8.01	6.53
2008	10.10	12.30	11.70	12.30	12.80	14.50	14.50	13.50	11.00	9.78	9.47	9.70	11.80	10.20
2009	10.30	9.88	9.49	10.10	11.10	11.90	11.10	11.00	9.97	9.49	9.63	10.20	10.35	10.20
2010	10.00	9.82	9.70	9.79	9.77	9.79	10.10	10.50	10.10	10.60	11.50	12.20	10.32	9.80
2011	11.70	13.00	12.80	13.30	13.70	13.40	13.70	13.70	12.90	11.80	11.80	11.90	12.81	11.50
2012	12.20	12.50	13.10	14.00	14.10	14.10	15.90	16.40	14.80	14.50	14.60	14.50	14.23	12.70
2013	14.60	14.80	15.00	14.70	15.10	15.60	15.80	14.90	13.40	12.60	12.70	13.10	14.36	14.70
2014	13.20	13.40	13.90	14.60	14.80	14.70	13.70	12.90	11.00	10.00	10.20	10.50	12.74	13.20
2015	10.50	10.20	10.10	9.94	9.91	9.91	10.30	10.00	9.00	8.80	8.84	8.94	9.70	10.20
2016	8.93	8.80	8.90	9.29	10.10	10.90	10.70	10.30	9.62	9.45	9.64	9.91	9.71	9.16
2017	9.96	10.10	9.97	9.51	9.58	9.27	9.77	9.47	9.50	9.42	9.41	9.56	9.63	9.69
2018	9.61	9.79	10.10	10.30	10.50	10.20	8.94	8.85	8.75	8.64	8.60	8.94	9.44	9.61
2019	8.94	8.91	8.83	8.57	8.39	8.71	8.80	8.60	8.60	8.93	8.94	9.17	8.78	8.73
2020	9.22	9.04	9.01	8.64	8.62	8.70	8.87	8.80	9.44	9.81	10.30	10.80	9.27	8.92
2021	10.90	12.60	13.00	14.00	15.00	14.40	14.30	13.60	12.40	11.90	11.90	11.90	12.99	11.10

*Marketing average is September of the previous year to August in the current year.

Source: Page 42 & 44 of this packet

Note: November & December 2021 prices were not available at the time this calculation was made so the October 2021 price was carried over

CROP PRICES

MONTHLY PRICES RECEIVED BY FARMERS CROPS, INDIANA, 2014-2021 ¹

Year	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Marketing Year Avg.
<u>Corn (Dollars per Bushel)</u>													
2014-15	3.59	3.48	3.54	3.80	3.86	3.93	3.94	3.84	3.74	3.67	4.03	3.90	3.75
2015-16	3.85	3.87	3.97	3.88	3.97	3.92	3.93	3.97	4.09	4.26	3.89	3.54	3.92
2016-17	3.41	3.40	3.44	3.57	3.64	3.73	3.77	3.77	3.79	3.84	3.86	3.64	3.63
2017-18	3.42	3.38	3.32	3.42	3.54	3.59	3.72	3.80	3.92	3.81	3.60	3.54	3.56
2018-19	3.45	3.44	3.49	3.70	3.76	3.79	3.75	3.68	3.81	4.28	4.55	4.27	3.78
2019-20	3.96	4.01	3.92	4.00	4.10	4.04	4.03	3.61	3.43	3.41	3.51	3.48	3.84
2020-21	3.77	3.73	3.82	4.06	4.32	4.74	4.95	5.39	5.87	6.32	6.22	6.39	4.45
<u>Soybeans (Dollars per Bushel)</u>													
2014-15	11.00	10.00	10.20	10.50	10.50	10.20	10.10	9.94	9.91	9.91	10.30	10.00	10.20
2015-16	9.00	8.80	8.84	8.94	8.93	8.80	8.90	9.29	10.10	10.90	10.70	10.30	9.16
2016-17	9.62	9.45	9.64	9.91	9.96	10.10	9.97	9.51	9.58	9.27	9.77	9.47	9.69
2017-18	9.50	9.42	9.41	9.56	9.61	9.79	10.10	10.30	10.50	10.20	8.94	8.85	9.61
2018-19	8.75	8.64	8.60	8.94	8.94	8.91	8.83	8.57	8.39	8.71	8.80	8.60	8.73
2019-20	8.60	8.93	8.94	9.17	9.22	9.04	9.01	8.64	8.62	8.70	8.87	8.80	8.92
2020-21	9.44	9.81	10.30	10.80	10.90	12.60	13.00	14.00	15.00	14.40	14.30	13.60	11.10
Year	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Marketing Year Avg.
<u>Wheat (Dollars per Bushel)</u>													
2014-15	5.64	5.20	4.88	4.54	4.83	4.19	5.42	5.42	5.48	5.47	4.83	4.72	5.22
2015-16	5.28	4.91	4.61	4.37	4.98	4.44	5.05	4.59	5.14	4.48	4.20	4.41	4.88
2016-17	4.45	4.12	3.98	3.48	3.64	3.67	3.98	3.92	4.17	4.60	4.15	4.22	4.04
2017-18	4.62	5.01	4.56	4.34	4.25	4.48	⁽²⁾	4.62	4.79	4.97	4.66	4.97	4.78
2018-19	4.83	4.83	5.25	4.95	4.40	5.19	5.37	5.46	5.56	5.21	4.14	5.01	4.90
2019-20	5.08	4.91	4.62	5.00	5.28	5.27	5.26	5.48	5.32	5.43	5.47	5.44	4.95
2020-21	5.23	5.18	5.34	5.62	5.78	5.95	6.15	5.75	5.93	⁽²⁾	⁽²⁾	⁽²⁾	5.28

¹ Weighted monthly average for market year. 2020 and 2021 are preliminary.

² Data not available.



Quick Stats

Program	Year	Period	Week Ending	Geo Level	State	State ANSI	Ag District	Ag District Code	County	County ANSI	Zip Code	Region	watershed_code	Watershed	Commodity	Data Item	Domain	Domain Category	CV Value (%)
SURVEY	2021	JAN		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN \$ / BU	TOTAL	NOT SPECIFIED	4.32
SURVEY	2021	FEB		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN \$ / BU	TOTAL	NOT SPECIFIED	4.74
SURVEY	2021	MAR		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN \$ / BU	TOTAL	NOT SPECIFIED	4.95
SURVEY	2021	APR		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN \$ / BU	TOTAL	NOT SPECIFIED	5.39
SURVEY	2021	MAY		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN \$ / BU	TOTAL	NOT SPECIFIED	5.87
SURVEY	2021	JUN		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN \$ / BU	TOTAL	NOT SPECIFIED	6.32
SURVEY	2021	JUL		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN \$ / BU	TOTAL	NOT SPECIFIED	6.22
SURVEY	2021	AUG		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN \$ / BU	TOTAL	NOT SPECIFIED	6.39
SURVEY	2021	SEP		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN \$ / BU	TOTAL	NOT SPECIFIED	5.28
SURVEY	2021	OCT		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN \$ / BU	TOTAL	NOT SPECIFIED	4.97



Quick Stats

Program	Year	Period	Week Ending	Geo Level	State	State ANSI	Ag District	Ag District Code	County	County ANSI	Zip Code	Region	watershed_code	Watershed	Commodity	Data Item	Domain	Domain Category	Value	CV (%)
SURVEY	2021	JAN		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN \$ / BU	TOTAL	NOT SPECIFIED	10.9	
SURVEY	2021	FEB		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN \$ / BU	TOTAL	NOT SPECIFIED	12.6	
SURVEY	2021	MAR		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN \$ / BU	TOTAL	NOT SPECIFIED	13	
SURVEY	2021	APR		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN \$ / BU	TOTAL	NOT SPECIFIED	14	
SURVEY	2021	MAY		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN \$ / BU	TOTAL	NOT SPECIFIED	15	
SURVEY	2021	JUN		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN \$ / BU	TOTAL	NOT SPECIFIED	14.4	
SURVEY	2021	JUL		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN \$ / BU	TOTAL	NOT SPECIFIED	14.3	
SURVEY	2021	AUG		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN \$ / BU	TOTAL	NOT SPECIFIED	13.6	
SURVEY	2021	SEP		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN \$ / BU	TOTAL	NOT SPECIFIED	12.4	
SURVEY	2021	OCT		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN \$ / BU	TOTAL	NOT SPECIFIED	11.9	

2016 Purdue Crop Cost & Return Guide

March 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

	Low Productivity Soil						Average Productivity Soil						High Productivity Soil					
	Rot. Beans		Wheat		DC Beans		Rot. Beans		Wheat		DC Beans		Rot. Beans		Wheat		DC Beans	
	Cont. Corn	Rot. Beans	Cont. Corn	Rot. Beans	Cont. Corn	Rot. Beans	Cont. Corn	Rot. Beans	Cont. Corn	Rot. Beans	Cont. Corn	Rot. Beans	Cont. Corn	Rot. Beans	Cont. Corn	Rot. Beans	Cont. Corn	Rot. Beans
Expected yield per acre ²	124	132	40	57	28	28	155	165	50	71	35	35	186	198	60	85	42	42
Harvest price ³	\$3.60	\$8.90	\$8.90	\$4.40	\$8.90	\$8.90	\$3.60	\$3.60	\$8.90	\$4.40	\$8.90	\$8.90	\$3.60	\$3.60	\$8.90	\$4.40	\$4.40	\$8.90
Market revenue	\$446	\$475	\$356	\$251	\$249	\$249	\$558	\$594	\$445	\$312	\$312	\$312	\$670	\$713	\$534	\$374	\$374	\$374
Less variable costs ⁴																		
Fertilizer ⁵	\$121	\$108	\$36	\$49	\$27	\$27	\$128	\$115	\$43	\$65	\$32	\$32	\$135	\$123	\$51	\$80	\$37	\$37
Seed ⁶	100	100	74	44	85	85	123	123	74	44	85	85	123	123	74	44	85	85
Pesticides ⁷	42	42	26	12	25	25	42	42	26	12	25	25	42	42	26	12	25	25
Dryer fuel ⁸	23	19	N/A	N/A	3	3	29	23	N/A	N/A	4	4	35	28	N/A	N/A	5	5
Machinery fuel @ \$1.73	13	13	8	8	6	6	13	13	8	8	6	6	13	13	8	8	6	6
Machinery repairs ⁹	22	22	18	18	15	15	22	22	18	18	15	15	22	22	18	18	15	15
Hauling ¹⁰	12	13	4	6	3	3	16	17	5	7	4	4	19	20	6	9	4	4
Interest ¹¹	10	10	6	4	5	5	12	11	6	5	6	6	12	11	6	5	6	6
Insurance/misc. ¹²	32	33	23	3	4	4	32	33	23	3	4	4	32	33	23	3	4	4
Total variable cost	\$375	\$360	\$195	\$144	\$173	\$173	\$417	\$399	\$203	\$162	\$181	\$181	\$433	\$415	\$212	\$179	\$187	\$187
Contribution margin ¹³ (Revenue - variable costs) per acre	\$71	\$115	\$161	\$107	\$76	\$76	\$141	\$195	\$242	\$150	\$131	\$131	\$237	\$298	\$322	\$195	\$187	\$187

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 March 30, 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 @ \$0.29; P₂O₅ @ \$0.43; K₂O @ \$0.29; 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 2016 rates. 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		1000		2700		900		1000		2700		900		1000		2700		3000	
	c-c	c-b	c-c	c-b	c-c	c-b	c-c	c-b	c-c	c-b	c-c	c-b	c-c	c-b	c-c	c-b	c-c	c-b	c-c	c-b
Crop contribution margin ²	\$71	\$138	\$71	\$138	\$71	\$138	\$141	\$219	\$141	\$219	\$141	\$219	\$237	\$310	\$237	\$310	\$237	\$310	\$237	\$310
Government payment ³	\$25	\$25	\$25	\$25	\$25	\$25	\$25	\$25	\$25	\$25	\$25	\$25	\$25	\$25	\$25	\$25	\$25	\$25	\$25	\$25
Total contribution margin	\$96	\$163	\$96	\$163	\$96	\$163	\$166	\$244	\$166	\$244	\$166	\$244	\$262	\$335	\$262	\$335	\$262	\$335	\$262	\$335
Annual overhead costs:																				
Machinery ownership ⁴	\$136	\$122	\$109	\$98	\$136	\$122	\$136	\$122	\$109	\$98	\$136	\$122	\$136	\$122	\$109	\$98	\$136	\$122	\$109	\$98
Family and hired labor ⁵	\$101	\$91	\$49	\$44	\$101	\$91	\$101	\$91	\$49	\$44	\$101	\$91	\$101	\$91	\$49	\$44	\$101	\$91	\$49	\$44
Land ⁶	\$161	\$161	\$161	\$161	\$213	\$213	\$213	\$213	\$213	\$213	\$213	\$213	\$269	\$269	\$269	\$269	\$269	\$269	\$269	\$269
Earnings or (losses)	-\$301	-\$211	-\$223	-\$140	-\$284	-\$182	-\$205	-\$111	-\$205	-\$111	-\$205	-\$111	-\$244	-\$147	-\$165	-\$76	-\$244	-\$147	-\$165	-\$76

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.

Prepared by: Craig L. Dobbins and Michael R. Langemeier, Department of Agricultural Economics; Bob Nielsen, Tony J. Vyn, and Shaun Casteel, Department of Agronomy; and Bill Johnson and Kiersten Wise, Department of Botany and Plant Pathology, Purdue University.

Date: 3/30/16

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2017 Purdue Crop Cost & Return Guide

March 2017 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

	Low Productivity Soil						Average Productivity Soil						High Productivity Soil					
	Rot.		Rot.		DC		Rot.		Rot.		DC		Rot.		Rot.		DC	
	Corn	Beans	Wheat	Beans	Wheat	Beans	Corn	Beans	Wheat	Beans	Wheat	Beans	Corn	Beans	Wheat	Beans	Corn	Beans
Expected yield per acre ²	128	136	42	60	29	29	160	170	52	75	36	36	192	204	62	90	43	43
Harvest price ³	\$3.70	\$9.60	\$4.20	\$9.60	\$9.60	\$9.60	\$3.70	\$3.70	\$9.60	\$4.20	\$9.60	\$9.60	\$3.70	\$3.70	\$9.60	\$4.20	\$9.60	\$9.60
Market revenue	\$474	\$503	\$403	\$252	\$278	\$278	\$592	\$629	\$499	\$315	\$346	\$346	\$710	\$755	\$595	\$378	\$413	\$413
Less variable costs ⁴																		
Fertilizer ⁵	\$120	\$107	\$35	\$51	\$26	\$26	\$127	\$115	\$42	\$67	\$31	\$31	\$134	\$122	\$49	\$83	\$35	\$35
Seed ⁶	98	98	71	44	82	82	119	119	71	44	82	82	119	119	71	44	82	82
Pesticides ⁷	54	54	46	15	43	43	54	54	46	15	43	43	54	54	46	15	43	43
Dryer fuel ⁸	30	24	N/A	N/A	4	4	38	30	N/A	N/A	5	5	45	36	N/A	N/A	5	5
Machinery fuel @ \$2.02	15	15	9	9	6	6	15	15	9	9	6	6	15	15	9	9	6	6
Machinery repairs ⁹	22	22	18	18	15	15	22	22	18	18	15	15	22	22	18	18	15	15
Hauling ¹⁰	13	14	4	6	3	3	16	17	5	8	4	4	19	20	6	9	4	4
Interest ¹¹	11	11	7	5	6	6	12	12	7	5	6	6	12	12	7	6	7	7
Insurance/misc. ¹²	36	36	31	9	9	9	38	38	34	9	9	9	40	40	34	9	9	9
Total variable cost	\$399	\$381	\$221	\$157	\$194	\$194	\$441	\$422	\$232	\$175	\$201	\$201	\$460	\$440	\$240	\$193	\$206	\$206
Contribution margin ¹³																		
(Revenue - variable costs)	\$75	\$122	\$182	\$95	\$84	\$84	\$151	\$207	\$267	\$140	\$145	\$145	\$250	\$315	\$355	\$185	\$207	\$207
per acre																		

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 2017 CME Group futures price less \$0.25 basis. Harvest soybean price is November 2017 CME Group futures price less \$0.35 basis. Harvest wheat price is July 2017 CME Group futures price less \$.35 basis. Harvest prices were based on opening prices on March 17, 2017. These prices will change.

Table 1 (Continued)

⁴Input prices for variable costs reflect expected prices for 2017. 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, 240-47-55-720, 240-59-63-720, 240-71-72-720; rotation corn, 200-50-57-600, 200-63-66-600, 200-75-75-600; rotation beans, 0-34-79-0, 0-42-93-0, 0-50-107-0; wheat, 58-38-42-172, 84-47-48-251, 110-57-53-330; double crop beans, 0-23-61-0, 0-29-70-0, 0-34-80-0. Fertilizer prices per lb.: NH₃ @ \$0.32; urea @ \$0.39; P₂O₅ @ \$0.27; lime @ \$19.00/ton spread on the field. For very poorly drained soils, consider increasing N rates by 5-10%. For well-drained soils, consider reducing N rates by 5-10%. 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.

¹²Includes crop insurance, general farm insurance, and miscellaneous cost. The cost of crop insurance represents the premium projected for a Revenue Protection (RP) policy at the 80% coverage level. 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		1000		2700		900		1000		2700		900		1000		2700		3000	
	c-c	c-b	c-c	c-b	c-c	c-b	c-c	c-b	c-c	c-b	c-c	c-b	c-c	c-b	c-c	c-b	c-c	c-b	c-c	c-b
Crop contribution margin ²	\$75	\$152	\$75	\$152	\$151	\$237	\$151	\$237	\$151	\$237	\$151	\$237	\$151	\$237	\$250	\$335	\$250	\$335	\$250	\$335
Government payment ³	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total contribution margin	\$75	\$152	\$75	\$152	\$151	\$237	\$151	\$237	\$151	\$237	\$151	\$237	\$151	\$237	\$250	\$335	\$250	\$335	\$250	\$335
Annual overhead costs:																				
Machinery ownership ⁴	\$137	\$123	\$109	\$98	\$137	\$123	\$109	\$98	\$137	\$123	\$109	\$98	\$137	\$123	\$109	\$98	\$137	\$123	\$109	\$98
Family and hired labor ⁵	\$90	\$81	\$47	\$42	\$90	\$81	\$47	\$42	\$90	\$81	\$47	\$42	\$90	\$81	\$47	\$42	\$90	\$81	\$47	\$42
Land ⁶	\$149	\$149	\$149	\$149	\$194	\$194	\$194	\$194	\$194	\$194	\$194	\$194	\$194	\$194	\$244	\$244	\$244	\$244	\$244	\$244
Earnings or (losses)	-\$301	-\$201	-\$230	-\$137	-\$270	-\$161	-\$270	-\$161	-\$270	-\$161	-\$199	-\$97	-\$221	-\$113	-\$150	-\$49	-\$221	-\$113	-\$150	-\$49

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 current farm bill will not provide ARC-County payments in 2017. Any 2017 payments will not be received until October 2018.

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 \$81,141 (\$89,858 of family living expenses less \$43,098 in net nonfarm income plus \$34,381 in income and self-employment taxes); a full-time employee with total compensation of \$41,542; and a part-time employee with compensation of \$3,583. 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 2016 cash rent per bushel of corn yield reported in the article entitled "Adjustment to Indiana Farmland Value and Cash Rent Continues," Purdue Agricultural Economics Report, August, 2016. The relatively low estimated contribution margins for 2017 will likely place downward pressure on cash rents, thus 2017 cash rents are assumed to be 5 percent below 2016 cash rents.

Prepared by: Craig L. Dobbins and Michael R. Langemeier, Department of Agricultural Economics; Bob Nielsen, Tony J. Vyn, and Shaun Casteel, Department of Agronomy; and Bill Johnson and Kiersten Wise, Department of Botany and Plant Pathology, Purdue University.

Date: 3/17/17

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2018 Purdue Crop Cost & Return Guide

March 2018 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	Beans	DC Beans	Cont. Corn	Rot. Corn	Beans	DC Beans	Cont. Corn	Rot. Corn	Beans	DC Beans				
Expected yield per acre ²	130	138	43	61	30	162	172	53	76	37	194	206	63	91	44	
Harvest price ³	\$3.70	\$3.70	\$9.90	\$4.30	\$9.90	\$3.70	\$3.70	\$9.90	\$4.30	\$9.90	\$3.70	\$3.70	\$9.90	\$4.30	\$9.90	
Market revenue	\$481	\$511	\$426	\$262	\$297	\$599	\$636	\$525	\$327	\$366	\$718	\$762	\$624	\$391	\$436	
Less variable costs ⁴																
Fertilizer ⁵	\$124	\$112	\$39	\$55	\$29	\$132	\$121	\$47	\$73	\$34	\$140	\$129	\$55	\$90	\$40	
Seed ⁶	91	91	67	44	78	111	111	67	44	78	111	111	67	44	78	
Pesticides ⁷	61	61	65	25	55	61	61	65	25	55	61	61	65	25	55	
Dryer fuel ⁸	35	28	N/A	N/A	4	44	35	N/A	N/A	5	52	42	N/A	N/A	5	
Machinery fuel @ \$2.46	18	18	11	11	8	18	18	11	11	8	18	18	11	11	8	
Machinery repairs ⁹	22	22	18	18	15	22	22	18	18	15	22	22	18	18	15	
Hauling ¹⁰	13	14	4	6	3	16	17	5	8	4	19	21	6	9	4	
Interest ¹¹	11	11	7	5	7	12	12	8	6	7	13	12	8	7	7	
Insurance/misc. ¹²	36	36	31	9	9	38	38	34	9	9	40	40	34	9	9	
Total variable cost	\$411	\$393	\$242	\$173	\$208	\$454	\$435	\$255	\$194	\$215	\$476	\$456	\$264	\$213	\$221	
Contribution margin ¹³																
(Revenue - variable costs) per acre	\$70	\$118	\$184	\$89	\$89	\$145	\$201	\$270	\$133	\$151	\$242	\$306	\$360	\$178	\$215	

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 dates, except soybean double-crop yield, which is based on a July 1 planting date. Rotation corn, rotation soybean, and wheat 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. Continuous corn yields are 94% of rotation corn yields. 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.

³Harvest corn price is December 2018 CME Group futures price less \$0.25 basis. Harvest soybean price is November 2018 CME Group futures price less \$0.35 basis. Harvest wheat price is July 2018 CME Group futures price less \$.35 basis. Harvest prices were based on opening prices on March 28, 2018. These prices will change.

Table 1 (Continued)

⁴Input prices for variable costs reflect expected prices for 2018. 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, 240-47-55-720, 240-59-63-720, 240-71-72-720; rotation corn, 200-50-57-600, 200-63-66-600, 200-75-75-600; rotation beans, 0-34-79-0, 0-42-93-0, 0-50-107-0; wheat, 58-38-42-172, 84-47-48-251, 110-57-53-330; double crop beans, 0-23-61-0, 0-29-70-0, 0-34-80-0. Fertilizer prices per lb.: NH₃ @ \$0.32; urea @ \$0.40; P₂O₅ @ \$0.46; K₂O @ \$0.29; lime @ \$19.00/ton spread on the field. For very poorly drained soils, consider increasing N rates by 5-10%. For well-drained soils, consider reducing N rates by 5-10%. 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.

¹²Includes crop insurance, general farm insurance, and miscellaneous cost. The cost of crop insurance represents the premium projected for a Revenue Protection (RP) policy at the 80% coverage level. 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	3000 c-b	900 c-c	1000 c-b	2700 c-c	900 c-c	1000 c-b	2700 c-c	3000 c-b
Crop contribution margin ²	\$70	\$151	\$151	\$145	\$236	\$145	\$242	\$333	\$242	\$333
Government payment ³	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total contribution margin	\$70	\$151	\$151	\$145	\$236	\$145	\$242	\$333	\$242	\$333
Annual overhead costs:										
Machinery ownership ⁴	\$138	\$130	\$86	\$138	\$130	\$91	\$138	\$130	\$91	\$86
Family and hired labor ⁵	\$73	\$66	\$37	\$73	\$66	\$41	\$73	\$66	\$41	\$37
Land ⁶	\$151	\$151	\$151	\$195	\$195	\$195	\$246	\$246	\$246	\$246
Earnings or (losses)	-\$292	-\$196	-\$123	-\$261	-\$155	-\$182	-\$215	-\$109	-\$136	-\$36

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 current farm bill will not provide ARC-County payments in 2018. Any 2018 payments will not be received until October 2019.

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 \$65,520 (\$85,186 of family living expenses less \$46,085 in net nonfarm income plus \$26,419 in income and self-employment taxes); a full-time employee with total compensation of \$42,084; and a part-time employee with compensation of \$3,630. 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 2017 cash rent per bushel of corn yield reported in the article entitled "Indiana Farmland Values and Cash Rents Continue to Adjust," Purdue Agricultural Economics Report, August, 2017. The relatively tight margins expected in 2018 result will likely dampen cash rents, thus 2018 cash rents are assumed to be 5% lower than 2017 cash rents.

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Date: 3/28/18

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2019 Purdue Crop Cost & Return Guide

March 2019 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	DC Beans	Cont. Corn	Rot. Corn	Rot. Beans	DC Beans	Cont. Corn	Rot. Corn	Rot. Beans	DC Beans			
Expected yield per acre ²	131	139	43	61	30	164	174	54	77	38	196	209	65	92	46
Harvest price ³	\$3.70	\$3.70	\$8.90	\$4.40	\$8.90	\$3.70	\$3.70	\$8.90	\$4.40	\$8.90	\$3.70	\$3.70	\$8.90	\$4.40	\$8.90
Market revenue	\$485	\$514	\$383	\$268	\$267	\$607	\$644	\$481	\$339	\$338	\$725	\$773	\$579	\$405	\$409
Less variable costs ⁴															
Fertilizer ⁵	\$143	\$128	\$43	\$60	\$32	\$152	\$138	\$53	\$80	\$39	\$160	\$147	\$62	\$98	\$46
Seed ⁶	91	91	67	44	78	111	111	67	44	78	111	111	67	44	78
Pesticides ⁷	58	58	50	30	45	58	58	50	30	45	58	58	50	30	45
Dryer fuel ⁸	32	26	N/A	N/A	4	40	32	N/A	N/A	5	48	39	N/A	N/A	6
Machinery fuel @ \$2.52	19	19	11	11	8	19	19	11	11	8	19	19	11	11	8
Machinery repairs ⁹	22	22	18	18	15	22	22	18	18	15	22	22	18	18	15
Hauling ¹⁰	13	14	4	6	3	16	17	5	8	4	20	21	7	9	5
Interest ¹¹	12	11	7	6	6	13	12	7	6	7	13	13	8	7	7
Insurance/misc. ¹²	36	36	31	9	9	38	38	34	9	9	40	40	34	9	9
Total variable cost	\$426	\$405	\$231	\$184	\$200	\$469	\$447	\$245	\$206	\$210	\$491	\$470	\$257	\$226	\$219
Contribution margin ¹³ (Revenue - variable costs) per acre	\$59	\$109	\$152	\$84	\$67	\$138	\$197	\$236	\$133	\$128	\$234	\$303	\$322	\$179	\$190

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 dates, except soybean double-crop yield, which is based on a July 1 planting date. Rotation corn, rotation soybean, and wheat 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. Continuous corn yields are 94% of rotation corn yields. 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.

³Harvest corn price is December 2019 CME Group futures price less \$0.25 basis. Harvest soybean price is November 2019 CME Group futures price less \$0.35 basis. Harvest wheat price is July 2019 CME Group futures price less \$.35 basis. Harvest prices were based on opening prices on March 28, 2019. These prices will change.

Table 1 (Continued)

⁴Input prices for variable costs reflect expected prices for 2018. 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, 240-47-55-720, 240-59-63-720, 240-71-72-720; rotation corn, 200-50-57-600, 200-63-66-600, 200-75-75-600; rotation beans, 0-34-79-0, 0-42-93-0, 0-50-107-0; wheat, 58-38-42-172, 84-47-48-251, 110-57-53-330; double crop beans, 0-23-61-0, 0-29-70-0, 0-34-80-0. Fertilizer prices per lb.: NH₃ @ \$0.38; urea @ \$0.43; P₂O₅ @ \$0.33; lime @ \$19.00/ton spread on the field. For very poorly drained soils, consider increasing N rates by 5-10%. For well-drained soils, consider reducing N rates by 5-10%. 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.

¹²Includes crop insurance, general farm insurance, and miscellaneous cost. The cost of crop insurance represents the premium projected for a Revenue Protection (RP) policy at the 80% coverage level. 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	3000 c-b	900 c-c	1000 c-b	3000 c-b	900 c-c	1000 c-b	3000 c-b
Crop contribution margin ²	\$59	\$131	\$131	\$138	\$217	\$217	\$234	\$313	\$313
Government payment ³	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total contribution margin	\$59	\$131	\$131	\$138	\$217	\$217	\$234	\$313	\$313
Annual overhead costs:									
Machinery ownership ⁴	\$138	\$130	\$80	\$138	\$130	\$80	\$138	\$130	\$80
Family and hired labor ⁵	\$89	\$80	\$43	\$89	\$80	\$43	\$89	\$80	\$43
Land ⁶	\$164	\$164	\$164	\$208	\$208	\$208	\$264	\$264	\$264
Earnings or (losses)	-\$333	-\$243	-\$156	-\$297	-\$201	-\$114	-\$257	-\$161	-\$74

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 current farm bill will not provide ARC-County or PLC payments in 2019.

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 \$78,106 (\$90,356 of family living expenses less \$42,285 in net nonfarm income plus \$30,035 in income and self-employment taxes); a full-time employee with total compensation of \$44,071; and a part-time employee with compensation of \$3,802. 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 2018 cash rent per bushel of corn yield reported in the article entitled "Indiana Farmland Values - Up, Down, and Sideways," Purdue Agricultural Economics Report, August, 2018. The relatively tight margins expected in 2019 will likely dampen increases in cash rents, thus 2019 cash rents are assumed to be the same as 2018 cash rents.

Prepared by: Michael R. Langemeier and Craig L. Dobbins, Department of Agricultural Economics; Bob Nielsen, Tony J. Vyn, and Shaun Casteel, Department of Agronomy; and Bill Johnson, Department of Botany and Plant Pathology, Purdue University.

Date: 3/28/19

It is the policy of the Purdue University Cooperative Extension Service that all persons have equal opportunity and access to its educational programs, services, activities, and facilities without regard to race, religion, color, sex, age, national origin or ancestry, marital status, parental status, sexual orientation, disability or status as a veteran. Purdue University is an Affirmative Action institution.

2020 Purdue Crop Cost & Return Guide

March 2020 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	DC Beans	Cont. Corn	Rot. Corn	Rot. Beans	DC Beans	Cont. Corn	Rot. Corn	Rot. Beans	DC Beans			
Expected yield per acre ²	133	141	44	62	31	165	176	54	77	38	198	211	65	93	46
Harvest price ³	\$3.40	\$3.40	\$8.35	\$5.20	\$8.35	\$3.40	\$3.40	\$8.35	\$5.20	\$8.35	\$3.40	\$3.40	\$8.35	\$5.20	\$8.35
Market revenue	\$452	\$479	\$367	\$322	\$259	\$561	\$598	\$451	\$400	\$317	\$673	\$717	\$543	\$484	\$384
Less variable costs ⁴															
Fertilizer ⁵	\$119	\$107	\$38	\$53	\$28	\$126	\$115	\$45	\$70	\$34	\$133	\$123	\$53	\$87	\$39
Seed ⁶	91	91	67	44	78	111	111	67	44	78	111	111	67	44	78
Pesticides ⁷	58	58	50	30	45	58	58	50	30	45	58	58	50	30	45
Dryer fuel ⁸	29	23	N/A	N/A	4	36	29	N/A	N/A	5	43	34	N/A	N/A	6
Machinery fuel @ \$.207	15	15	9	9	7	15	15	9	9	7	15	15	9	9	7
Machinery repairs ⁹	22	22	18	18	15	22	22	18	18	15	22	22	18	18	15
Hauling ¹⁰	13	14	4	6	3	17	18	5	8	4	20	21	7	9	5
Interest ¹¹	11	11	7	5	6	12	12	7	6	6	12	12	7	7	7
Insurance/misc. ¹²	36	36	31	9	9	38	38	34	9	9	40	40	34	9	9
Total variable cost	\$394	\$377	\$224	\$174	\$195	\$435	\$418	\$235	\$194	\$203	\$454	\$436	\$245	\$213	\$211
Contribution margin ¹³ (Revenue - variable costs) per acre	\$58	\$102	\$143	\$148	\$64	\$126	\$180	\$216	\$206	\$114	\$219	\$281	\$298	\$271	\$173

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 dates, except soybean double-crop yield, which is based on a July 1 planting date. Rotation corn, rotation soybean, and wheat 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. Continuous corn yields are 94% of rotation corn yields. 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.

³Harvest corn price is December 2020 CME Group futures price less \$0.25 basis. Harvest soybean price is November 2020 CME Group futures price less \$0.35 basis. Harvest wheat price is July 2020 CME Group futures price less \$.35 basis. Harvest prices were based on opening prices on March 24, 2020. These prices will change.

Table 1 (Continued)

⁴Input prices for variable costs reflect expected prices for 2020. 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: Purdue Extension Bulletin, AY-9-32, 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, 240-47-55-720, 240-59-63-720, 240-71-72-720; rotation corn, 200-50-57-600, 200-63-66-600, 200-75-75-600; rotation beans, 0-34-79-0, 0-42-93-0, 0-50-107-0; wheat, 58-38-42-172, 84-47-48-251, 110-57-53-330; double crop beans, 0-23-61-0, 0-29-70-0, 0-34-80-0. Fertilizer prices per lb.: NH₃ @ \$0.31; urea @ \$0.39; P₂O₅ @ \$0.38; K₂O @ \$0.30; lime @ \$19.00/ton spread on the field. For very poorly drained soils, consider increasing N rates by 5-10%. For well-drained soils, consider reducing N rates by 5-10%. 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.

¹²Includes crop insurance, general farm insurance, and miscellaneous cost. The cost of crop insurance represents the premium projected for a Revenue Protection (RP) policy at the 80% coverage level. 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 ownership, 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		1000		2700		900		1000		2700		900		1000		2700		3000	
	c-c	c-b	c-c	c-b	c-c	c-b	c-c	c-b	c-c	c-b	c-c	c-b	c-c	c-b	c-c	c-b	c-c	c-b	c-c	c-b
Crop contribution margin ²	\$58	\$123	\$58	\$123	\$58	\$123	\$126	\$198	\$126	\$198	\$126	\$198	\$219	\$290	\$219	\$290	\$219	\$290	\$219	\$290
Government payment ³	\$23	\$23	\$23	\$23	\$23	\$23	\$23	\$23	\$23	\$23	\$23	\$23	\$23	\$23	\$23	\$23	\$23	\$23	\$23	\$23
Total contribution margin	\$81	\$146	\$81	\$146	\$81	\$146	\$149	\$221	\$149	\$221	\$149	\$221	\$242	\$313	\$242	\$313	\$242	\$313	\$242	\$313
Annual overhead costs:																				
Machinery ownership ⁴	\$138	\$130	\$85	\$80	\$85	\$80	\$138	\$130	\$138	\$130	\$85	\$80	\$138	\$130	\$138	\$130	\$85	\$80	\$85	\$80
Family and hired labor ⁵	\$72	\$65	\$43	\$39	\$43	\$39	\$72	\$65	\$72	\$65	\$43	\$39	\$72	\$65	\$72	\$65	\$43	\$39	\$43	\$39
Land ⁶	\$159	\$159	\$159	\$159	\$159	\$159	\$208	\$208	\$208	\$208	\$208	\$208	\$208	\$208	\$208	\$208	\$208	\$208	\$208	\$208
Earnings or (losses)	-\$288	-\$208	-\$206	-\$132	-\$206	-\$132	-\$269	-\$182	-\$269	-\$182	-\$187	-\$106	-\$225	-\$139	-\$225	-\$139	-\$143	-\$63	-\$143	-\$63

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 current farm bill will provide PLC payments for corn base acres in 2020.

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 \$78,106 (\$90,356 of family living expenses less \$42,285 in net nonfarm income plus \$30,035 in income and self-employment taxes); a full-time employee with total compensation of \$44,071; and a part-time employee with compensation of \$3,802. 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 2019 cash rent per bushel of corn yield reported in the article entitled "2019 Indiana Farmland Values and Cash Rents Slide Lower," Purdue Agricultural Economics Report, August, 2019. The relatively tight margins expected in 2020 will likely dampen increases in cash rents, thus 2020 cash rents are assumed to be the same as 2019 cash rents.

Prepared by: Michael R. Langemeier and Craig L. Dobbins, Department of Agricultural Economics; Bob Nielsen, Tony J. Vyn, and Shaun Casteel, Department of Agronomy; and Bill Johnson, Department of Botany and Plant Pathology, Purdue University.

Date: 3/24/20

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2021 Purdue Crop Cost & Return Guide

February 2021 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. Beans	Wheat	DC Beans	Cont. Corn	Rot. Beans	Wheat	DC Beans	Cont. Corn	Rot. Beans	Wheat	DC Beans			
Expected yield per acre ²	135	144	44	62	31	169	180	55	77	39	203	216	66	93	46
Harvest price ³	\$4.30	\$4.30	\$11.50	\$6.10	\$11.50	\$4.30	\$4.30	\$11.50	\$6.10	\$11.50	\$4.30	\$4.30	\$11.50	\$6.10	\$11.50
Market revenue	\$581	\$619	\$506	\$378	\$357	\$727	\$774	\$633	\$470	\$449	\$873	\$929	\$759	\$567	\$529
Less variable costs ⁴															
Fertilizer ⁵	\$123	\$111	\$43	\$59	\$32	\$132	\$121	\$52	\$76	\$38	\$141	\$131	\$61	\$95	\$44
Seed ⁶	91	91	67	44	78	111	111	67	44	78	111	111	67	44	78
Pesticides ⁷	58	58	50	30	45	58	58	50	30	45	58	58	50	30	45
Dryer fuel ⁸	29	23	N/A	N/A	4	36	29	N/A	N/A	5	44	35	N/A	N/A	6
Machinery fuel @ \$2.09	15	15	9	9	7	15	15	9	9	7	15	15	9	9	7
Machinery repairs ⁹	22	22	18	18	15	22	22	18	18	15	22	22	18	18	15
Hauling ¹⁰	14	14	4	6	3	17	18	6	8	4	20	22	7	9	5
Interest ¹¹	11	11	7	6	6	12	12	7	6	7	13	12	7	7	7
Insurance/misc. ¹²	36	36	31	9	9	38	38	34	9	9	40	40	34	9	9
Total variable cost	\$399	\$381	\$229	\$181	\$199	\$441	\$424	\$243	\$200	\$208	\$464	\$446	\$253	\$221	\$216
Contribution margin ¹³ (Revenue - variable costs) per acre	\$182	\$238	\$277	\$197	\$158	\$286	\$350	\$390	\$270	\$241	\$409	\$483	\$506	\$346	\$313

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 dates, except soybean double-crop yield, which is based on a July 1 planting date. Rotation corn, rotation soybean, and wheat 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. Continuous corn yields are 94% of rotation corn yields. 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.

³Harvest corn price is December 2021 CME Group futures price less \$0.25 basis. Harvest soybean price is November 2021 CME Group futures price less \$0.35 basis. Harvest wheat price is July 2021 CME Group futures price less \$.35 basis. Harvest prices were based on opening prices on February 9, 2021. These prices will change.

Table 1 (Continued)

⁴Input prices for variable costs reflect expected prices for 2021. 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: Purdue Extension Bulletin, AY-9-32, 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, 240-47-55-720, 240-59-63-720, 240-71-72-720; rotation corn, 200-50-57-600, 200-63-66-600, 200-75-75-600; rotation beans, 0-34-79-0, 0-42-93-0, 0-50-107-0; wheat, 58-38-42-172, 84-47-48-251, 110-57-53-330; double crop beans, 0-23-61-0, 0-29-70-0, 0-34-80-0. Fertilizer prices per lb.: NH₃ @ \$0.31; urea @ \$0.40; P₂O₅ @ \$0.49; K₂O @ \$0.31; lime @ \$19.00/ton spread on the field. For very poorly drained soils, consider increasing N rates by 5-10%. For well-drained soils, consider reducing N rates by 5-10%. 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.

¹²Includes crop insurance, general farm insurance, and miscellaneous cost. The cost of crop insurance represents the premium projected for a Revenue Protection (RP) policy at the 80% coverage level. 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 ownership, 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	900 c-c	1000 c-b	2700 c-c	900 c-c	1000 c-b	2700 c-c	3000 c-b
Crop contribution margin ²	\$182	\$258	\$182	\$286	\$370	\$286	\$409	\$495	\$409	\$495
Government payment ³	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total contribution margin	\$182	\$258	\$182	\$286	\$370	\$286	\$409	\$495	\$409	\$495
Annual overhead costs:										
Machinery ownership ⁴	\$138	\$130	\$85	\$138	\$130	\$85	\$138	\$130	\$85	\$80
Family and hired labor ⁵	\$72	\$64	\$43	\$72	\$64	\$43	\$72	\$64	\$43	\$39
Land ⁶	\$171	\$171	\$171	\$223	\$223	\$223	\$274	\$274	\$274	\$274
Earnings or (losses)	-\$199	-\$107	-\$117	-\$147	-\$47	-\$65	-\$75	\$27	\$7	\$102

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 current farm bill will not provide ARC-CO or PLC payments for base acres in 2021.

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 \$64,488 (\$84,991 of family living expenses less \$45,217 in net nonfarm income plus \$24,714 in income and self-employment taxes); a full-time employee with total compensation of \$47,141; and a part-time employee with compensation of \$4,066. 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 2020 cash rent per bushel of corn yield reported in the article entitled "Indiana Farmland Values Increase but Signal Concern of Potential COVID-19 Slump," Purdue Agricultural Economics Report, July, 2020. The relatively tight margins expected in 2020 will likely dampen increases in cash rents, thus 2021 cash rents are assumed to be the same as 2020 cash rents.

Prepared by: Michael R. Langemeier and Craig L. Dobbins, Department of Agricultural Economics; Bob Nielsen, Tony J. Vyn, and Shaun Casteel, Department of Agronomy; and Bill Johnson, Department of Botany and Plant Pathology, Purdue University.

Date: 2/9/21

It is the policy of the Purdue University Cooperative Extension Service that all persons have equal opportunity and access to its educational programs, services, activities, and facilities without regard to race, religion, color, sex, age, national origin or ancestry, marital status, parental status, sexual orientation, disability or status as a veteran. Purdue University is an Affirmative Action institution.

Calculation of Average Government Payments per Acre

January 1, 2022

Line #	2016	2017	2018	2019	2020
1	624,674,000	373,228,000	516,224,000	878,992,000	1,323,732,000
2	0	0	0	0	0
3	-202,000	0	-3,638,000	-3,787,000	-2,648,000
4	624,472,000	373,228,000	512,586,000	875,205,000	1,321,084,000
5	12,590,633	12,590,633	12,909,673	12,909,673	12,909,673
6	49.60	29.64	39.71	67.79	102.33

Source: USDA-Indiana Ag Statistics Service

1	Total Government Payment	2016	2017	2018	2019	2020
2	Milk Income Loss Payment	P-65	P-65	P-65	P-65	P-65
3	Dairy Margin Protection Program	P-65	P-65	P-65	P-65	P-65
5	Cropland Acres	P-68	P-68	P-66	P-66	P-66

Data for 2021 is not currently available. The Department has estimated the Government Payment per Acre for 2021 in the following way.

Average Total Government Payment (2016-2020)	743,370,000
Average Milk Income Loss Payment (2016-2020)	0
Average Dairy Margin Protection Pymt (2016-2020)	-2,055,000
Estimated Net Government Payment for 2021	741,315,000
Cropland Acres (P-66)	12,909,673
Estimated Payment Per Acre for 2021	57.42

INDIANA



AGRICULTURAL STATISTICS 2020-2021

FARM INCOME

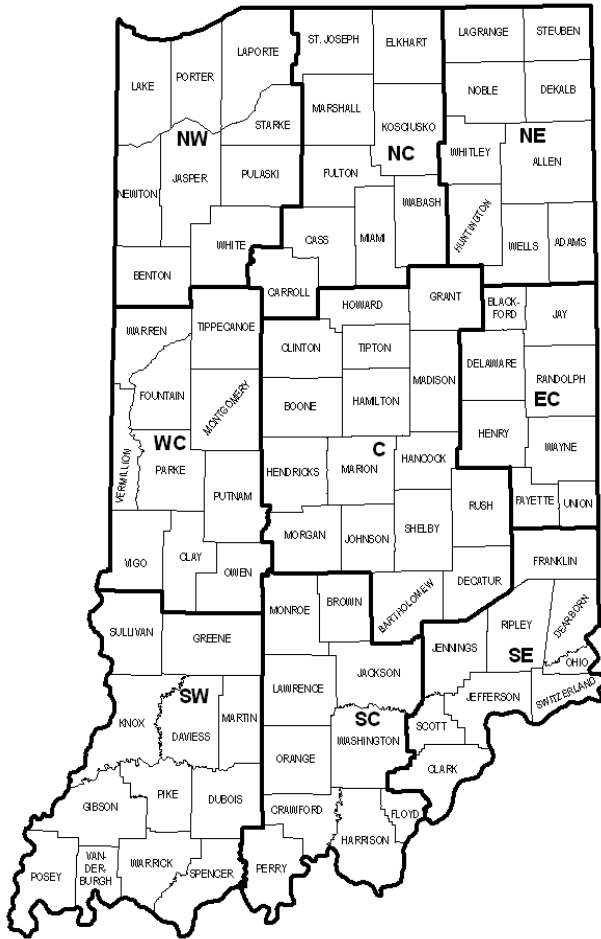
FARM PRODUCTION EXPENSES, BY CATEGORY, INDIANA, 2016-2020 ¹

Item	2016	2017	2018	2019	2020
	Thousand Dollars				
Total Production Expenses	10,715,787	10,249,444	10,053,933	10,124,337	10,222,516
Intermediate Product Expenses					
Farm-origin Expenses	2,665,357	2,510,786	2,462,764	2,733,692	2,655,729
Feed Purchases	1,450,000	1,150,000	1,130,000	1,380,000	1,350,000
Livestock and Poultry	255,357	370,786	392,764	393,692	325,729
Seed Purchases	960,000	990,000	940,000	960,000	980,000
Manufactured Inputs	2,062,254	2,009,080	2,150,280	1,994,537	2,069,321
Pesticide Expenditures	560,000	560,000	560,000	560,000	580,000
Fertilizer, Lime, and Soil Conditioner	1,060,000	960,000	1,080,000	950,000	1,050,000
Fuels and Oils	315,587	377,194	394,785	381,843	339,497
Electricity	126,667	111,886	115,495	102,694	99,824
Other Intermediate Inputs	1,784,727	1,790,820	1,705,825	1,649,710	1,730,422
Labor Expenses					
Cash Expenses	441,254	479,917	502,668	431,996	464,448
Contract Labor	36,237	26,356	16,363	11,094	16,314
Hired Labor and Employee Compensation	405,017	453,561	486,304	420,902	448,134
Non-cash Employee Compensation	8,746	20,083	17,332	3,004	5,552
Interest Expenses	532,285	615,953	684,172	686,996	631,732
Net Rent, Including Landlord Capital Consumption	1,249,667	1,114,357	982,791	1,124,805	1,163,528
Property Taxes and Fees	435,711	462,678	536,821	506,316	490,948
Personal Property Taxes	32,386	48,450	33,351	34,510	33,148
Motor Vehicle Registration and Licensing Fees	25,711	27,678	26,821	26,316	25,948
Real Estate	377,614	386,550	476,649	445,490	431,852
Capital Consumption	1,535,787	1,245,770	1,011,280	993,281	1,010,837
Data as of September 2, 2021					
¹ All data includes Operator Dwellings					
Source: Economic Research Service					

U.S. GOVERNMENT DIRECT FARM PROGRAM PAYMENTS BY PROGRAM, INDIANA, 2016-2020 ^{1 2 3}

Program	2016	2017	2018	2019	2020
	Thousand Dollars				
Fixed Direct Payments	42	0	(13)	(19)	(142)
Cotton Ginning Cost-Share (CGCS) Program	9	0	8	0	0
Average Crop Revenue Election Program (ACRE)	6	0	0	0	0
Price Loss Coverage (PLC)	2,498	8,700	7,764	2,453	91,778
Agricultural Risk Coverage (ARC)	539,282	285,888	50,301	4,453	117,924
Loan Deficiency Payments	0	0	0	(1)	2
Dairy Margin Protection Program	202	0	3,638	3,787	2,648
Conservation	73,219	77,745	87,747	78,290	83,342
Supplemental and ad hoc disaster assistance	9,416	790	847	37,201	843,212
Miscellaneous Programs ⁴	0	105	365,931	752,827	184,968
Total	624,674	373,228	516,224	878,992	1,323,732
Data as of September 2, 2021					
NA = Data are not available/applicable.					
Values are rounded to the nearest hundred.					
¹ Gross payments from the U.S. government to the farm sector					
² Payments returned to the U.S. government by the farm sector					
³ Accounting adjustments. A negative value indicates payments returned exceeded gross payments during the calendar year.					
⁴ Includes Market Facilitation Program.					
Source: Economic Research Service					

COUNTY HIGHLIGHTS



COUNTY HIGHLIGHTS

The following pages of county statistics represent the results of a survey of over 15,000 farm operators following the 2020 harvest season. In addition to these data are selected items of interest from the U.S. Population Census, 2017 Census of Agriculture, and 2019 Cash Receipts information from the Bureau of Economic Analysis. The County Highlights section summarizes the importance of agriculture to each and every Indiana County while comparing the magnitude of importance across counties.

Planted acreage for hay is represented by three dashes because this category is not estimated, planted acreage and yield for popcorn are represented by three dashes because these categories are not surveyed; in all other places the three dashes represent zero for that county. An asterisk signifies that the county has data for this item, but it cannot be disclosed for confidentiality purposes. The 2017 Chicken data from Census includes only layers twenty weeks old and older.

Below is a list of comparable items at the state level.

STATE DATA

2020 Census Population	6,785,528	2019 Cash Receipts	\$10,913,352,000
2017 Total Land Area (acres)	22,928,355	Crop Receipts	\$6,857,055,000
2017 Number of Farms	56,649	Livestock Receipts	\$4,056,297,000
2017 Land in Farms (acres)	14,969,996	2019 Other Income	\$1,905,995,000
2017 Average Size of Farm (acres)	264	Government Payments	\$853,097,000
2017 Value of Land & Bldgs (avg/acre)	\$6,576	Imputed Income/Rent Received	\$1,052,898,000
2017 Cropland (acres)	12,909,673	2019 Total Income	\$12,819,347,000
2017 Harvested Cropland (acres)	12,345,774	Less: Production Expenses	\$10,494,776,000
2017 Pastureland, all types (acres)	716,911	Realized Net Income	\$2,324,571,000
2017 Woodland (acres)	1,034,784		

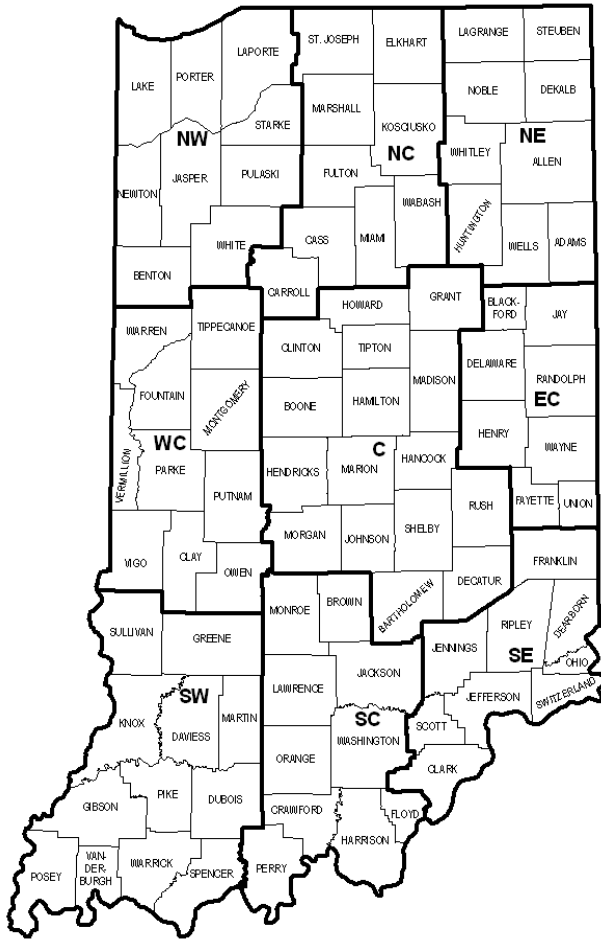
<u>2020 CROPS</u>	<u>PLTGD</u>	<u>HARV</u>	<u>YLD</u>	<u>UNIT</u>	<u>PROD</u>	<u>LIVESTOCK</u>	<u>NUMBER HEAD</u>
Corn	5,400,000	5,250,000	187.0	Bu	981,750,000	Jan 2021 All Cattle	850,000
Soybeans	5,700,000	5,680,000	58.0	Bu	329,440,000	Beef Cows	194,000
Wheat	300,000	250,000	70.0	Bu	17,500,000	Milk Cows	191,000
Alfalfa Hay	---	220,000	2.90	Ton	638,000	2017 All Hogs	4,004,388
Other Hay	---	280,000	2.30	Ton	644,000	2017 All Sheep	62,085
2017 Popcorn	---	79,222	---	Lbs	352,386,717	2017 Chickens	26,354,377
						2017 Turkeys	7,350,556

INDIANA



AGRICULTURAL STATISTICS 2017-2018

COUNTY HIGHLIGHTS



COUNTY HIGHLIGHTS

The following pages of county statistics represent the results of a survey of over 15,000 farm operators following the 2017 harvest season. In addition to these data are selected items of interest from the U.S. Population Census, 2012 Census of Agriculture, and 2016 Cash Receipts information from the Bureau of Economic Analysis. The County Highlights section summarizes the importance of agriculture to each and every Indiana County while comparing the magnitude of importance across counties.

Planted acreage for hay is represented by three dashes because this category is not estimated, planted acreage and yield for popcorn are represented by three dashes because these categories are not surveyed; in all other places the three dashes represent zero for that county. An asterisk signifies that the county has data for this item, but it cannot be disclosed for confidentiality purposes. The 2012 Chicken data from Census includes only layers twenty weeks old and older.

Below is a list of comparable items at the state level.

STATE DATA

2016 Census Population	6,619,680	2016 Cash Receipts	\$10,122,960,000
2012 Total Land Area (acres)	22,928,756	Crop Receipts	\$6,536,930,000
2012 Number of Farms	58,695	Livestock Receipts	\$3,586,030,000
2012 Land in Farms (acres)	14,720,396	2016 Other Income	\$1,540,497,000
2012 Average Size of Farm (acres)	251	Government Payments	\$648,105,000
2012 Value of Land & Bldgs (avg/acre)	\$5,354	Imputed Income/Rent Received	\$892,392,000
2012 Cropland (acres)	12,590,633	2016 Total Income	\$11,663,457,000
2012 Harvested Cropland (acres)	12,146,538	Less: Production Expenses	\$10,320,505,000
2012 Pastureland, all types (acres)	762,619	Realized Net Income	\$1,342,952,000
2012 Woodland (acres)	1,048,632		

<u>2017 CROPS</u>	<u>PLTD</u>	<u>HARV</u>	<u>YLD</u>	<u>UNIT</u>	<u>PROD</u>	<u>LIVESTOCK</u>	<u>NUMBER HEAD</u>
Corn	5,350,000	5,190,000	180.0	Bu	934,200,000	Jan 2018 All Cattle	870,000
Soybeans	5,950,000	5,940,000	54.0	Bu	320,760,000	Beef Cows	208,000
Wheat	290,000	240,000	74.0	Bu	17,760,000	Milk Cows	187,000
Alfalfa Hay	---	270,000	3.30	Ton	891,000	2012 All Hogs	3,747,352
Other Hay	---	310,000	2.40	Ton	744,000	2012 All Sheep	52,169
2012 Popcorn	---	61,092	---	Lbs	151,728,996	2012 Chickens	25,587,222
						2012 Turkeys	5,084,794

AN OVERVIEW OF HOW THE CALENDAR IS USED IN CALCULATING THE AG LAND BASE RATE

<u>SPRING, 2020</u>	<u>SUMMER, 2020</u>	<u>FALL, 2020</u>	<u>WINTER, 2020</u>	<u>SPRING, 2021</u>	<u>SUMMER, 2021</u>
Planting 2020 crops	Care for 2020 crops	Harvest 2020 crops	Prep equipment for storage	Planting 2021 crops	Care for 2021 crops
Sell a portion of the 2019 crops	Sell remainder of the 2019 crops	Sell a portion of the 2020 crops	Sell a portion of the 2020 crops	Sell a portion of the 2020 crops	Sell remainder of the 2020 crops
Paying 1/1/19 Property Taxes		Paying 1/1/19 Property Taxes		Paying 1/1/20 Property Taxes	
Collect all or a portion of 2020 Cash Rent		Collect remainder of 2020 Cash Rent, if any due		Collect all or a portion of 2021 Cash Rent	

CASH RENT INCOME - CALENDAR YEAR

OPER. INCOME -
1/3 NOVEMBER
GRAIN PRICES

OPERATING INCOME - 1/3 MARKET YEAR AVERAGE OF GRAIN PRICES

OPERATING INCOME - 1/3 CALENDAR YEAR AVERAGE OF GRAIN PRICES

STATE OF INDIANA

DEPARTMENT OF LOCAL GOVERNMENT FINANCE



INDIANA GOVERNMENT CENTER NORTH
100 NORTH SENATE AVENUE N1058(B)
INDIANAPOLIS, IN 46204
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Agricultural Land Base Rates for The Assessment Dates: January 1, 2018 – 2022

Data Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Tax Year										
22 Pay 23					\$1,500					
21 Pay 22				\$1,290						
20 Pay 21			\$1,280							
19 Pay 20		\$1,560								
18 Pay 19	\$1,610									

The Agricultural Land Base Rate calculation was first established for the 2002 general reassessment and was developed in compliance with the St. John’s court case. The statute related to the base rate calculation can be found at Ind. Code § 6-1.1-4-4.5(e).

The base rates shown above are made for the January 1 assessment dates of 2018 payable in 2019 through 2022 payable in 2023. They are based on a rolling six-year average of the market value in use. Once each of the market values is determined, the highest value for that six-year period is eliminated and the remaining five years are averaged. The statute then provides instructions to determine the capitalization rate used to calculate the final base rate.

Ind. Code § 6-1.1-4-13(a) provides that “land shall be assessed as agricultural land only when it is devoted to agricultural use”. This means that a parcel or a portion of the parcel is eligible for this base rate when it qualifies for it. Once the base rate is applied to land classified as agricultural land, the assessor then applies soil productivity factors and influence factors when appropriate.

As illustrated in the following equation, the market value in use of agricultural land is calculated by dividing the net income of each acre by the appropriate capitalization rate.

$$\text{Market value in use} = \text{Net Income} / \text{Capitalization Rate}$$

The change in market value in use from year to year is based on changes in cash rent, yields, production costs, market prices, and interest rates for each of the six years involved.

For example, the change for 2022 pay 2023 was the result of the removal of the 2015 data and the addition of the 2021 data.