STATE OF INDIANA

DEPARTMENT OF LOCAL GOVERNMENT FINANCE

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REFERENCE MATERIALS FOR VALUING AGRICULTURAL LAND FOR JANUARY 1, 2020

BASE RATE - $1,280

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General Notes for the Agricultural Land Market
Value in Use for January 1, 2020 Rate of $1,280

December, 2019

History:

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 our calculations can be found in Chapter 2, Page 100 of those guidelines, in Table 2-18. For the 2002 reassessment, the base rate for agricultural land 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 En olle A t 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 (2005) also contained language for March 1, 2007 which instructed the Department of Local Government Finance to adjust our methodology from a four-year rolling average to a six-year rolling average (IC 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, Senate Enrolled Act 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 Senate Enrolled Act 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, Senate Enrolled Act 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, & 2009 data, adding the 2013, 2014, & 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.

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

IC 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, 2020

Table 2-18 – Years:
For January 1, 2020, the six years of data used in the calculations were: 2014, 2015, 2016, 2017, 2018, and 2019.

Table 2-18 – Net Income from Cash Rents:
Since agricultural land in Indiana is almost evenly divided between cash rent and owner-occupied production, our agency used an average of both types of income in our calculation.

The data for cash rents came from three Purdue Agricultural Economics Reports (PAER). For the 2014 & 2015 rents, go to Table 2 of Page 2 (P-19) of the August of 2015 report. For the 2016 & 2017 rents, go to Table 4 of Page 7 (P-21) of the August of 2017 report. For the 2018 & 2019 rents, go to Table 4 of Page 8 (P-23) of the August of 2019 report. From these tables, we 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 of Local Government Finance.

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 our agency adopted comes from Table 1 (P-13) of the June 24, 1999 Doster/Huie report.

Doster/Huie Report – Table 1-Years:
This report used the years of 1996, 1997, 1998, & 1999. The year of 1999 was removed from our 2002 calculations since our calculations were based on January 1, 1999. Information for 1995 was obtained and added to our 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 1995-2018 publication for corn on Page 36 in the Final Yield per Acre column of the Crop Summary section and on Page 38 for soybeans.

Doster/Huie Report – Table 1-Prices:
The prices used in this report were for the month of November. They can found in IASS publications for that time period. Note: Our agency 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 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, & family/hired labor can be found on the Purdue Crop Guide (ID-166). The dollar amount for each crop type can be found in 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, & real estate taxes equals 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 our agency adopted comes from Table 1 of the June 24, 1999 Doster/Huie report, we did make some alterations to it.

Adjustments Made To The Doster/Huie Report By the Department:

Years:
Added the statistics for 1995 which were available and deleted the estimates for 1999 since interest rates and income data were not available.

Price:
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 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. The FRBC publishes an agricultural newsletter on a quarterly basis 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 year period were comparable.

Summary of the January 1, 2020 Base Rate:
The Department first calculated the Table 2-18 Base Rate with the years of 2014, 2015, 2016, 2017, 2018, and 2019. Next, the highest market value in use for one of the years (2014) in the six-year rolling average was eliminated from the calculation. Then the provisions under Ind. Code § 6-1.1-4-4.5(e)(4) determined the capitalization rates of 8% which lowered the Preliminary Table 2-18 Base Rate of $2,000 to a Final Base Rate of $1,280. (Refer to Page 15 of this packet for a detailed comparison.)

Note: A simple explanation for the decrease from last year's base rate of $1,560 is the data for 2013 dropped off of the six-year rolling average this year. The 2013 data was also the highest market value in use last year so it was excluded from last year's calculation. This means that the 2013 data naturally dropped off of the calculation and the next highest data (2014) also dropped off of this year's calculation.

Valuing Agricultural Land

The agricultural land assessment formula involves the identification of agricultural tracts using data from detailed soil maps, aerial photography, and local plat maps. Each variable in the land assessment formula is measured using appropriate devices to determine its size and effect on the parcel's assessment. Uniformity is maintained in the assessment of agricultural land through the proper use of soil maps, interpreted data, and unit values.

In order to apply the agricultural land assessment formula, you need to understand the following topics, which are discussed in the sections below:

- agricultural land base rate values
- assessment of agricultural land
- 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

The rest of the chapter provides instructions for completing the "Land Data and Computations" section of the agricultural property record card.

Agricultural Land Base Rate Value

The 2002 general reassessment 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.

Market value in use = Net Income ÷ 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 State Board of Tax Commissioners utilized a four-year rolling average (1995 to 1998) 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 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 in use.

Table 2-18. Agricultural Land market value in use

	NET INCOMES		CAP. RATE	MARKET VALUE IN USE		
YEAR	Cash Rent	Operating		Cash Rent	Operating	Average
1995	$88	$56	9.92%	$887	$565	$ 726
1996	$94	$131	9.29%	$1012	$1410	$1,211
1997	$100	$124	9.31%	$1074	$1332	$1,203
1998	$102	$91	9.10%	$1121	$1000	$1,060
				Average Market Value in Use =		$1,050

The statewide agricultural land base rate value for the 2002 general reassessment will be the average market value in use calculated as shown above or $1,050 per acre.

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. Some commercial and industrial zoned acreage tracts devote a portion of the parcel to an agricultural use. The assessor classifies these parcels as either commercial or industrial. However, the portion of land devoted to agricultural use should be valued using the agricultural land assessment formula. Portions not used for agricultural purposes would be valued using the commercial and industrial acreage guidelines described in this chapter.

Converting Units of Measurement for Agricultural Land

Figure 2-23 shows the units of measurement commonly used to measure agricultural land. Table 2-19 describes equivalencies for these units of measurement.

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Certification of Agricultural Land Base Rate Value for Assessment Year 2020

This memorandum hereby serves to notify assessing officials of the agricultural base rate to be used for the January 1, 2020 assessment date: **$1,280 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 2020 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.

Market value in use = Net Income ÷ 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 (2014 to 2019) 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

	NET INCOMES			MARKET VALUE IN USE		
Year	Cash Rent	Operating	Cap. Rate	Cash Rent	Operating	Average
~~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	950	1,606
2019	181	-25	8.00%	2,263	-313	975
				Average Market Value in Use		**$1,280**

The statewide agricultural land base rate value for the 2020 assessment year will be $1,280 per acre.

Dated January 3, 2020

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/]	$2.69	$6.90	$2.60	$6.88	$2.06	$5.49	$2.04	$5.40
Sales	$331	$262	$317	$299	$282	$231	$274	$232
Less variable costs[2/]	134	94	137	96	148	85	145	86
Crops contribution margin	$197	$168	$180	$203	$134	$146	$129	$146
Plus government payment[3/]	$23		$45		$53		$34	
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/]	10		10		10		10	
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/]	$2.69	$6.90	$2.60	$6.88	$2.06	$5.49	$2.04	$5.40
Sales	$407	$323	$390	$369	$348	$280	$337	$285
Less variable costs[2/]	153	103	157	106	170	91	167	92
Crops contribution margin	$254	$220	$233	$263	$178	$189	$170	$193
Plus government payment[3/]	$29		$56		$64		$42	
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/]	14		14		14		14	
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, 2020
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

	NET INCOMES PER ACRE		RATE	MARKET VALUE IN USE PER ACRE		AVERAGE MARKET VALUE IN USE PER ACRE
Year	Cash Rent	Owner-Operated	Cap. Rate	Cash Rent	Owner-Operated	
~~2014~~	~~205~~	~~171~~	~~4.77%~~	~~4,298~~	~~3,585~~	~~3,941~~
2015	198	-39	4.74%	4,177	-823	1,677
2016	173	75	4.78%	3,619	1,569	2,594
2017	175	30	5.04%	3,472	595	2,034
2018	181	76	5.58%	3,244	1,362	2,303
2019	181	-25	5.57%	3,250	-449	1,400

Preliminary Table 2-18 Base Rate (Average - 5 Lowest Years) $2,000

Determination of Capitalization Rate:

Prior Year's Final Base Rate	1,560	IC 6-1.1-4-4.5(e)(4) (See statute for exact language)
Current Year's Preliminary Base Rate Percent	2,000	(A) If there is an increase of 10% or more, the rate will be 8%.
Difference	28.2%	(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%.
IC 6-1.1-4-4.5(e) Capitalization Rate To Use:	8%	

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

	NET INCOMES PER ACRE		RATE	MARKET VALUE IN USE PER ACRE		AVERAGE MARKET VALUE IN USE PER ACRE
Year	Cash Rent	Owner-Operated	Cap. Rate	Cash Rent	Owner-Operated	
~~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	76	8.00%	2,263	950	1,606
2019	181	-25	8.00%	2,263	-313	975

Final Base Rate (Average - 5 Lowest Years) **$1,280**

Table 2-18 - Updated for January 1, 2020
Source: Real Property Assessment Guidelines

	Column A		Column B		Column C		Column D	Column E	Column F	
	NET INCOMES PER ACRE				RATE		MARKET VALUE IN USE PER ACRE		AVERAGE MARKET VALUE IN USE PER ACRE	
Year	Cash Rent		Owner-Operated		Cap. Rate		Cash Rent	Owner-Operated		
~~2014~~	~~205~~	~~P-17~~	~~171~~	~~P-33~~	~~4.77%~~	~~P-26~~	~~4,298~~	~~3,585~~	~~3,941~~	(1)
2015	198	P-17	-39	P-33	4.74%	P-26	4,177	-823	1,677	(1)
2016	173	P-17	75	P-33	4.78%	P-26	3,619	1,569	2,594	(1)
2017	175	P-17	30	P-33	5.04%	P-26	3,472	595	2,034	(1)
2018	181	P-17	76	P-33	5.58%	P-26	3,244	1,362	2,303	(1)
2019	181	P-17	-25	P-33	5.57%	P-26	3,250	-449	1,400	(1)
								Base Rate (Average - 5 Lowest Years)	$2,000	(2)
Formula:	Gross Cash Rent Less Property Taxes		Gross Income Less Expenses		Average of Qtly. 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.

Market Value in Use = Net Income ÷ Capitalization Rate

Table 2-18 - Updated for January 1, 2020
Calculation for Net Income-Cash Rent Column

Year	Gross Cash Rent		Less Property Taxes		Net Cash Rent	Cap. Rate		Cash Rent Value
2014	232	P-19	-27	P-25	205	4.77%	P-26	4,298
2015	229	P-19	-31	P-25	198	4.74%	P-26	4,177
2016	204	P-21	-31	P-25	173	4.78%	P-26	3,619
2017	205	P-21	-30	P-25	175	5.04%	P-26	3,472
2018	210	P-23	-29	P-25	181	5.58%	P-26	3,244
2019	207	P-23	-26	P-25	181	5.57%	P-26	3,250

P.A.E.R

Purdue Agricultural Economics Report

Your source for in-depth agricultural news straight from the experts.

August 2015

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The Bears Control the 2015 Indiana Farmland Market

Craig L. Dobbins, Professor and Kim Cook, Research Associate

Last year at this time there were signals that the boom propelling crop agriculture upward for ten years was running out of gas. Since then, the continued low grain prices have begun to influence things other than net farm income. Purchases of machinery, buildings, farmland, and other capital items have declined. There has also been a steady flow of reports about declining farmland values in the Midwest. This year's Purdue Farmland Value Survey will be another such report.

This survey has been conducted in June for more than 40 years. Farmland market professionals are surveyed to track changes in Indiana's farmland market[1].

Farmland Values

For the state as a whole, all qualities of farmland declined. Top, average, and poor quality farmland declined by 5.1%, 3.8%, and 4.8%, respectively (Table 1). Top, average, and poor farm land quality had a per acre value of $9,266, $7,672, and $5,863, respectively. This is the first time since 2009 that all three farmland quality classes declined. In 2009, there were small declines of 0.2%, 1.2%, and 1.7% for top, average, and poor quality land, respectively.

The state average corn yield for each farmland quality was up again this year. Top, average and poor farmland had expected yields of 200, 169, and

[1] The individuals surveyed include rural appraisers, agricultural loan officers, FSA personnel, farm managers, and farmers. The results of the survey provide information about the general level and trend in farmland values.

farmland declined by 8.8% for the state. Since last year's survey indicated a 22.6% increase in average value, this year's decline is more likely a downward correction than a change in the direction of an upward trend. State-wide there was almost no change in the value of recreational land (Table 1).

These two markets are highly specialized. Values are strongly influenced by the planned use, tract size and location. Values in these markets have a very wide range. In June 2015, transitional land reports ranged from $2,800 to $35,000 per acre. Recreational land reports ranged from $1,500 to $10,500.

Table 2. Average estimated Indiana cash rent per acre, (tillable, bare land) 2014 and 2015, Purdue Land Value Survey, June 2015

			Rent/Acre		Change	Rent/bu. of Corn		Rent as % of June Land Value	
	Land	Corn	2014	2015	'14-'15	2014	2015	2014	2015
Area	Class	bu/A	$/A	$/A	%	$/bu.	$/bu.	%	%
North	Top	202	297	284	-4.4%	1.47	1.41	3.1	3.0
	Average	168	228	227	-0.4%	1.36	1.35	3.0	3.0
	Poor	136	166	167	0.6%	1.22	1.23	3.0	3.0
Northeast	Top	191	261	262	0.4%	1.37	1.37	2.9	2.9
	Average	161	205	203	-1.0%	1.27	1.26	2.7	2.7
	Poor	130	159	156	-1.9%	1.22	1.20	2.6	2.5
W. Central	Top	213	352	334	-5.1%	1.65	1.57	3.4	3.2
	Average	182	291	281	-3.4%	1.60	1.54	3.3	3.2
	Poor	156	233	224	-3.9%	1.49	1.44	3.4	3.2
Central	Top	202	305	296	-3.0%	1.52	1.47	3.2	3.1
	Average	173	248	241	-2.8%	1.43	1.39	3.0	2.9
	Poor	144	197	188	-4.6%	1.38	1.31	3.0	2.9
Southwest	Top	204	277	278	0.4%	1.36	1.36	2.7	2.7
	Average	167	204	216	5.9%	1.22	1.29	2.7	2.9
	Poor	124	143	149	4.2%	1.15	1.20	2.9	3.0
Southeast	Top	184	186	202	8.6%	1.01	1.10	3.6	4.0
	Average	150	141	152	7.8%	0.95	1.01	3.2	3.5
	Poor	114	98	118	20.4%	0.86	1.04	2.8	3.4
Indiana	Top	200	292	285	-2.4%	1.46	1.43	3.1	3.1
	Average	169	232	229	-1.3%	1.37	1.36	3.0	3.0
	Poor	137	179	175	-2.2%	1.31	1.28	3.0	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.

Because of the wide range of values in these markets, the median value[2] may give a more meaningful picture than the arithmetic average. On a state-wide basis, the median value of transitional land in June 2015 was $10,000 per acre, the same value as reported in 2014. The median value for rural recreational land in June 2015 was $3,500 per acre, $375 less than in 2014.

Respondents were asked to estimate the value of rural home sites located on a blacktop or well-maintained gravel road with no accessible gas line or city utilities. Like transitional farmland and recreational farmland these properties have a very wide range in value. Because of this wide range, median values are reported. The median value for five-acre home sites ranged from $8,000 per acre in the Southeast region to $11,000 per acre in the West Central and Central region (Table 3). Reported per acre median values of the larger tracts (10 acres) ranged from $8,250 per acre in the Southeast region to $11,000 per acre in the West Central, region. For 2015, the home site data indicate that the change in values was mixed.

[2] The median is the middle observation in data arranged in ascending or descending numerical order.

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 Survey[2] 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

[1]The Chicago District includes Iowa and Michigan, and parts of Wisconsin, Illinois, and Indiana.
[2]The 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 2016 $/A	Rent/Acre 2017 $/A	Change '16-'17 %	Rent/bu. of Corn 2016 $/bu.	Rent/bu. of Corn 2017 $/bu.	Rent as % of June Land Value 2016 %	Rent as % of June Land Value 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%.

PURDUE AGRICULTURAL ECONOMICS REPORT

YOUR SOURCE FOR IN-DEPTH AGRICULTURAL
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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 decline of $3 per acre. Poor quality land had a cash rent of $166 per acre, a decline of $2 per acre.

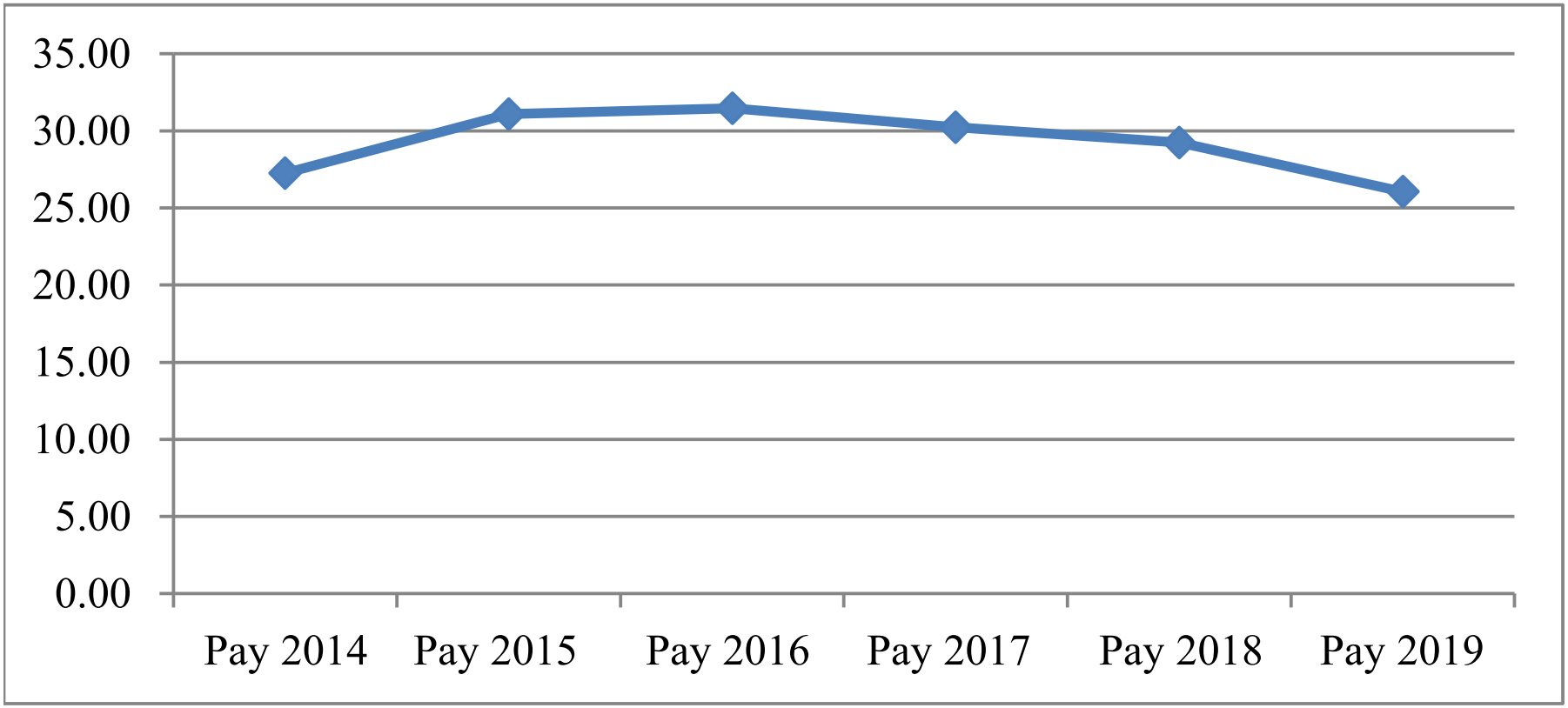
Comparing regional cash rent changes, a decline occurred for all land classes in the Northeast, West Central, Central, and Southwest. The Southwest re-

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

			Rent/Acre		Change	Rent/bu. of Corn		Rent as % of June Land Value	
	Land	Corn	2018	2019	'18-'19	2018	2019	2018	2019
Area	Class	bu./A	$/A	$/A	%	$/bu.	$/bu.	%	%
	Top	201	263	263	0.0%	1.26	1.31	3.1	3.3
North	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
	Top	195	233	226	-3.0%	1.21	1.16	2.8	3.0
Northeast	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
	Top	218	297	284	-4.4%	1.40	1.30	3.1	3.1
W. Central	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
	Top	204	273	251	-8.1%	1.34	1.23	3.0	2.9
Central	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
	Top	220	263	233	-11.4%	1.24	1.06	3.0	2.9
Southwest	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
	Top	193	186	189	1.6%	0.97	0.98	2.7	3.2
Southeast	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
	Top	204	261	249	-4.6%	1.28	1.22	3.0	3.0
Indiana	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.

Average Net Tax Bill/Acre of Farmland



January 1, 2020
Average Net Tax Bill/Acre of Farmland

Pay 2014	27.24
Pay 2015	31.07
Pay 2016	31.46
Pay 2017	30.22
Pay 2018	29.23
Pay 2019	26.05

January 1, 2020

		Real Estate Loans	Operating Loans	Avg.	Source:
2014	Jan.	4.66	4.93		P-28
	April	4.67	4.86		P-28
	July	4.62	4.89		P-28
	Oct.	4.61	4.87		P-28
	Average	4.64	4.89	4.77	
2015	Jan.	4.57	4.80		P-28
	April	4.64	4.81		P-28
	July	4.58	4.82		P-28
	Oct.	4.67	4.96		P-28
	Average	4.62	4.85	4.74	
2016	Jan.	4.65	4.91		P-30
	April	4.57	4.89		P-30
	July	4.57	4.87		P-30
	Oct.	4.71	5.03		P-30
	Average	4.63	4.93	4.78	
2017	Jan.	4.80	5.13		P-30
	April	4.86	5.20		P-30
	July	4.84	5.16		P-30
	Oct.	4.93	5.34		P-30
	Average	4.86	5.21	5.04	
2018	Jan.	5.14	5.53		P-32
	April	5.28	5.69		P-32
	July	5.46	5.86		P-32
	Oct.	5.61	6.07		P-32
	Average	5.37	5.79	5.58	
2019	Jan.	5.53	6.04		P-32
	April	5.39	5.98		P-32
	July	5.08	5.71		P-32
	Oct. (1)	5.08	5.71		P-32
	Average	5.27	5.86	5.57	

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

(1) - The information for the 4th quarter of 2019 was not available at the time of this publication so the 3rd quarter of 2019 was used.

The Agricultural Newsletter
from the Federal Reserve Bank of Chicago
Number 1971 *February 2016*

AgLetter

FARMLAND VALUES AND CREDIT CONDITIONS

Summary
Farmland values in the Seventh Federal Reserve District experienced an annual decrease of 3 percent for 2015, matching the yearly decline for 2014. Furthermore, "good" farmland values in the fourth quarter of 2015 were down 1 percent from the third quarter, according to 199 survey respondents representing agricultural banks across the District. Nearly 60 percent of the survey respondents anticipated agricultural land values to decrease during the January through March period of 2016, while none expected agricultural land values to increase in the areas surrounding their respective banks.

In the fourth quarter of 2015, agricultural credit conditions regressed once again. Repayment rates on non-real-estate farm loans were much lower in the October through December period of 2015 versus the same period of 2014, and higher rates of loan renewals and extensions reflected a tightened credit environment. Moreover, for 2016, almost 2 percent of farm loan customers were not expected to qualify for additional operating credit at the banks of the survey respondents. Given that non-real-estate loan demand was well above the level of a year ago and funds available for lending were just above the level of a year earlier, the average loan-to-deposit ratio for the District (72.9 percent) reached its highest level since the third quarter of 2010. Average interest rates on agricultural loans moved up toward the end of 2015.

Farmland values
The District saw an annual decrease of 3 percent in "good" farmland values for 2015, equaling its yearly decrease for 2014 and marking the first consecutive annual decline since the 1980s (see chart 1 on next page). In addition, the final quarter of 2015 was the sixth straight quarter without the District as a whole seeing a year-over-year increase in agricultural land values. In the fourth quarter of 2015, Illinois, Indiana, Iowa, and Michigan experienced year-over-year declines in agricultural land values, whereas Wisconsin experienced a small rise (see table and map below). The District's farmland values decreased 1 percent in the fourth quarter of 2015 relative to the third quarter.

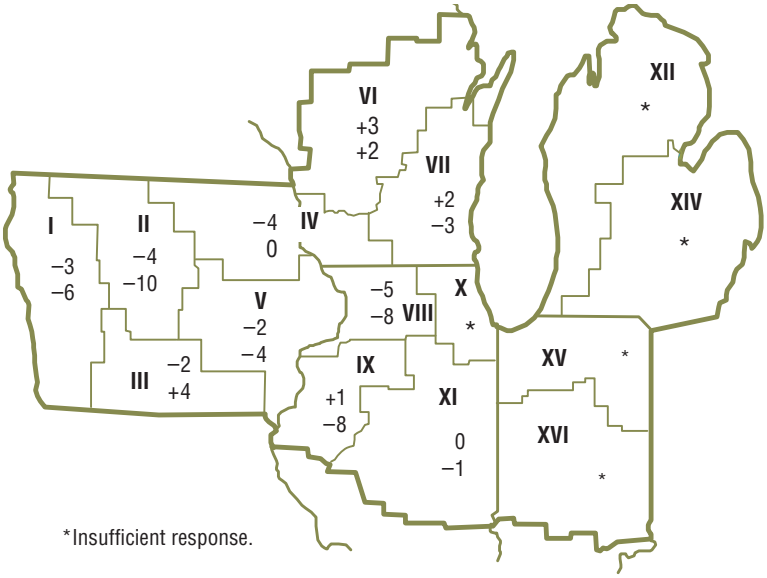
When adjusted for inflation, the District's decrease in farmland values for 2015 was actually smaller than the one for 2014 (because the inflation rate was lower in 2015). Put in real terms, the decrease in the District's farmland values from their peak in 2013 to 2015 was 7.5 percent (see chart 2 on next page). However, in 2015 the index of inflation-adjusted farmland values for the District was still 331 percent higher than at its trough in 1986.

Although agricultural land values fell again in 2015, the five District states' corn harvest was the third largest ever and their soybean harvest was the largest ever (surpassing the previous record level, set in 2014). According to U.S. Department of Agriculture (USDA) data, 2015 production

Percent change in dollar value of "good" farmland

Top: October 1, 2015 to January 1, 2016
Bottom: January 1, 2015 to January 1, 2016

	October 1, 2015 to January 1, 2016	January 1, 2015 to January 1, 2016
Illinois	−1	−4
Indiana	−2	−4
Iowa	−3	−5
Michigan	+1	−2
Wisconsin	+2	+2
Seventh District	−1	−3



*Insufficient response.

Credit conditions at Seventh District agricultural banks

	Loan demand	Funds availability	Loan repayment rates	Average loan-to-deposit ratio	Interest rates on farm loans: Operating loans[a]	Feeder cattle[a]	Real estate[a]
	(index)[b]	*(index)*[b]	*(index)*[b]	*(percent)*	*(percent)*	*(percent)*	*(percent)*
2014							
Jan–Mar	114	128	96	67.0	4.93	5.07	4.66
Apr–June	110	123	93	67.3	4.86	4.98	4.67
July–Sept	123	106	85	69.5	4.89	5.01	4.62
Oct–Dec	137	109	69	70.6	4.87	5.03	4.61
2015							
Jan–Mar	141	105	57	69.0	4.80	4.95	4.57
Apr–June	140	102	64	72.1	4.81	4.97	4.64
July–Sept	125	105	60	72.3	4.82	4.96	4.58
Oct–Dec	134	104	43	72.9	4.96	5.07	4.67

[a]At end of period.
[b]Bankers 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.

observing an increase in the demand for non-real-estate loans and 16 percent observing a decrease, the index of loan demand was 134 in the fourth quarter of 2015—the ninth quarter in a row above 100. Funds availability during the fourth quarter of 2015 was above the level of a year ago, as it has been in every period since the third quarter of 2006. The index of funds availability edged down to 104, with funds availability higher at 9 percent of the survey respondents' banks and lower at 5 percent of them. The District's average loan-to-deposit ratio rose to 72.9 percent—8.1 percentage points below the average level desired by the responding bankers.

Tighter credit standards compared with a year ago reinforced a pattern of agricultural credit deterioration. Forty-three percent of the survey respondents noted their banks had tightened credit standards for agricultural loans in the fourth quarter of 2015 relative to the fourth quarter of 2014, 57 percent noted their banks had left credit standards essentially unchanged, and none noted their banks had eased credit standards. Credit tightening was evident from the survey responses: 20 percent of responding bankers reported 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 2015 relative to the same period of a year ago, and none required smaller amounts. Finally, as of January 1, 2016, the average interest rates for farm operating loans (4.96 percent), feeder cattle loans (5.07 percent), and agricultural real estate loans (4.67 percent) had all moved up from their all-time lows (established early in 2015).

Looking forward

Given reports of subpar cash flows and too much spending by farm operations, survey respondents projected 1.9 percent of their farm customers with operating credit in 2015 were not likely to qualify for new operating credit in 2016 (half of a percentage point above the level reported a year ago). Responding bankers expected volumes for non-real-estate agricultural loans (in particular, those for operating loans and loans guaranteed by the Farm Service Agency) to be higher during the January through March period of 2016 relative to the same period of 2015. Volumes for grain storage loans, farm machinery loans, feeder cattle loans, dairy loans, and farm real estate loans were forecasted to be down in the first quarter of 2016 relative to the same quarter of a year earlier.

There was a strong sentiment among survey respondents that the downward trend for capital spending on farmland or land improvements, buildings and facilities, machinery and equipment, and trucks and autos would continue into 2016. Moreover, 59 percent of the responding bankers anticipated farmland values to decline further in the first quarter of 2016, and none anticipated them to rise. So, no improvements in the short-term prospects of the farm sector were anticipated by the survey respondents; they noted that controlling costs and utilizing risk-management tools would be critical to the health of farms in the coming year.

David B. Oppedahl, *senior business economist*

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The Agricultural Newsletter
from the Federal Reserve Bank of Chicago
Number 1979 *February 2018*

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.

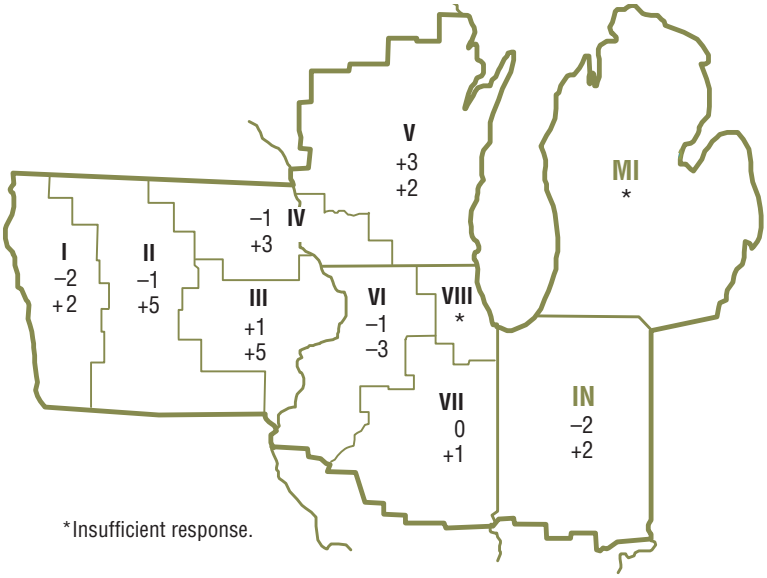
Farmland values
The District saw an annual increase of 1 percent in "good" farmland values for 2017, bucking the trend of annual declines suffered over the previous three years (see chart 1 on next page). With farmland values up slightly for 2017, the District avoided exceeding the three consecutive 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



*Insufficient response.

Credit conditions at Seventh District agricultural banks

	Loan demand	Funds availability	Loan repayment rates	Average loan-to-deposit ratio	Interest rates on farm loans: Operating loans[a]	Feeder cattle[a]	Real estate[a]
	(index)[b]	*(index)*[b]	*(index)*[b]	*(percent)*	*(percent)*	*(percent)*	*(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

[a]At end of period.
[b]Bankers 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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The Agricultural Newsletter
from the Federal Reserve Bank of Chicago
Number 1986 *November 2019*

AgLetter

FARMLAND VALUES AND CREDIT CONDITIONS

Summary
In the third quarter of 2019, farmland values for the Seventh Federal Reserve District were down 1 percent from a year ago, despite signs of strength in some areas. Moreover, according to the 170 District agricultural bankers who responded to the October 1 survey, values for "good" agricultural land were 1 percent higher in the third quarter of 2019 than in the second quarter. Although 76 percent of survey respondents expected the District's farmland values to be stable during the fourth quarter of 2019, there was a downward tilt to the expectations of bankers, as only 6 percent of them anticipated an increase in farmland values in the final quarter of this year and 18 percent anticipated a decrease.

The District's agricultural credit conditions slid yet again in the third quarter of 2019. Repayment rates for non-real-estate farm loans were down relative to the third quarter of 2018, and loan renewals and extensions were up. Demand for non-real-estate farm loans was higher than a year earlier. Also, for the first time since the second quarter of 2017, the availability of funds for lending by agricultural banks was up for a quarter relative to a year ago. In line with these results, the average loan-to-deposit ratio for the District edged down to 78.8 percent in the third quarter of 2019 from 80.2 percent in the second quarter (its all-time high). Average interest rates on agricultural loans moved down during the third quarter of 2019, which aided farm borrowers.

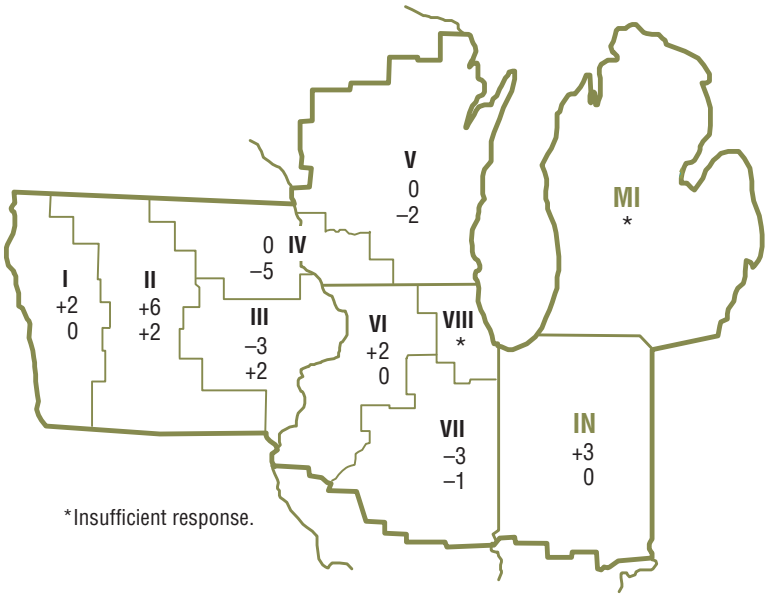
Farmland values
The District saw a year-over-year decrease of 1 percent in its farmland values in the third quarter of 2019. The District has not experienced a year-over-year change in its agricultural land values of greater than 1 percent over the past 12 quarters—an unprecedented streak of relative stability in farmland values. Nevertheless, there was substantial variation in farmland value changes among the District's five states. Farmland values for Illinois and Wisconsin were down on a year-over-year basis (1 percent and 2 percent, respectively), while Indiana and Iowa farmland values were both unchanged from a year ago (see map and table below). The District's agricultural land values were up 1 percent from the second quarter of 2019, although Illinois's experienced a 1 percent quarterly decrease.

Challenging weather conditions during planting, a touch of drought in the summer, excess precipitation during harvest, and early frost all hampered District crop production in 2019. According to U.S. Department of Agriculture (USDA) forecasts, the five District states' harvest of corn for grain in 2019 is projected to drop by 11 percent from 2018, to 5.88 billion bushels, and their soybean harvest is

Percent change in dollar value of "good" farmland

Top: July 1, 2019 to October 1, 2019
Bottom: October 1, 2018 to October 1, 2019

	July 1, 2019 to October 1, 2019	October 1, 2018 to October 1, 2019
Illinois	–1	–1
Indiana	+3	0
Iowa	+2	0
Michigan	*	*
Wisconsin	0	–2
Seventh District	+1	–1



*Insufficient response.

Credit conditions at Seventh District agricultural banks

	Loan demand	Funds availability	Loan repayment rates	Average loan-to-deposit ratio	Interest rates on farm loans: Operating loans[a]	Feeder cattle[a]	Real estate[a]
	(index)[b]	*(index)*[b]	*(index)*[b]	*(percent)*	*(percent)*	*(percent)*	*(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

[a]At end of period.
[b]Bankers 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.

Looking forward

Seventy-six percent of survey respondents predicted District farmland values to be stable in the fourth quarter of 2019, 18 percent predicted them to decrease, and 6 percent predicted them to increase. More respondents anticipated farmers to have weaker rather than stronger demand to acquire farmland this fall and winter compared with a year earlier, but the survey results showed the opposite for nonfarm investors. Additionally, respondents expected a rise in transfers of agricultural properties: 31 percent of the responding bankers forecasted an increase in the volume of farmland transfers relative to the fall and winter of a year ago, while 17 percent forecasted a decrease.

For the seventh consecutive year, crop net cash earnings were expected to contract over the fall and winter from their levels of a year earlier: 17 percent of survey respondents forecasted crop net cash earnings to increase over the next three to six months relative to a year ago, and 63 percent forecasted these earnings to decrease. According to the responding bankers, hog, cattle, and dairy farmers in the District were yet again expected to encounter diminished net cash earnings over the fall and winter relative to a year ago. Only 7 percent of the survey respondents predicted higher net earnings for hog and cattle operations over the next three to six months relative to a year earlier, while 59 percent predicted lower net earnings. Prospects for dairy operations looked slightly better, particularly as there were more survey respondents in Michigan and Wisconsin who anticipated higher net earnings for dairies this fall and winter relative to a year ago than those who anticipated lower net earnings.

Survey respondents expected loan repayment rates to decline this fall and winter from a year ago: Just 6 percent of the responding bankers forecasted a higher volume of farm loan repayments over the next three to six months compared with a year earlier, while 33 percent forecasted a lower volume. In addition, forced sales or liquidations of farm assets owned by financially distressed farmers were anticipated to increase in the next three to six months relative to a year ago, according to 54 percent of the responding bankers (only 2 percent anticipated a decrease). The District's non-real-estate farm loan volume in the October through December period of 2019 was expected to be higher compared with the same period of 2018. Similarly, the volume for District farm real estate loans was predicted to be higher in the fourth quarter of 2019 than a year earlier.

One responding banker from Indiana observed "an overall sense of unease among our farmers." Furthermore, a survey respondent from Illinois commented on "trade issues causing most of the uncertainty and stress" among local bank customers. Though the farm sector is facing some volatility, current conditions could provide opportunities for some; as the Indiana banker wrote, "I expect this market will eliminate highly leveraged operators and allow others to expand their operations."

David B. Oppedahl, *senior business economist*

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

	Column	A	B	C	D	E	F	G	H	I	J	K	L
		2014		2015		2016		2017		2018		2019	
Line #		Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans
1	Yield	188	55.5	150	50	173	57.5	180	54	189	58.5	165	49
2	Price - November	3.54	10.20	3.97	8.84	3.44	9.64	3.32	9.41	3.49	8.58	4.01	8.94
3	Price - Annual Avg.	4.20	12.74	3.87	9.70	3.78	9.71	3.63	9.63	3.63	9.43	3.99	8.76
4	Price - Market Avg.	4.47	13.20	3.75	10.20	3.92	9.16	3.63	9.69	3.56	9.61	3.60	8.75
5	GI - November	665.52	566.10	595.50	442.00	595.12	554.30	597.60	508.14	659.61	501.93	661.65	438.06
6	GI -Annual Avg.	789.60	707.07	580.50	485.00	653.94	558.33	653.40	520.02	686.07	551.66	658.35	429.24
7	GI - Market Avg.	840.36	732.60	562.50	510.00	678.16	526.70	653.40	523.26	672.84	562.19	594.00	428.75
8	AA v Nov	124.08	140.97	-15.00	43.00	58.82	4.02	55.80	11.88	26.46	49.73	-3.30	-8.82
9	MA v Nov	174.84	166.50	-33.00	68.00	83.04	-27.60	55.80	15.12	13.23	60.25	-67.65	-9.31
10	NRTL - November	70		-49		55		7		51		-10	
11	NRTL - Annual Avg	203		-35		86		41		89		-16	
12	NRTL - Market Avg	241		-32		83		42		88		-48	
13	NRTL Average	171		-39		75		30		76		-25	
14	FRBC RE Rate	0.0464		0.0462		0.0463		0.0486		0.0537		0.0527	
15	FRBC OP Rate	0.0489		0.0485		0.0493		0.0521		0.0579		0.0586	
16	Avg. FRBC Rate	0.0477		0.0474		0.0478		0.0504		0.0558		0.0557	
17	Operating Market Value In Use	3,585		-823		1,569		595		1,362		-449	

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

Sources: (pages references within this packet)

		2014	2015	2016	2017	2018	2019
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, 2019	A 2014 Corn	B Beans	C 2015 Corn	D Beans	E 2016 Corn	F Beans	G 2017 Corn	H Beans	I 2018 Corn	J Beans	K 2019 Corn	L Beans	Source of Information
1	Yield per Acre	188	55.5	150	50	173	57.5	180	54	189	58.5	165	49	IN Ag. Stats. Service
2	Price per Bu. - November	3.54	10.20	3.97	8.84	3.44	9.64	3.32	9.41	3.49	8.58	4.01	8.94	IN Ag. Stats. Service
3	Sales	666	566	596	442	595	554	598	508	660	502	662	438	Line 1 X Line 2
4	Less Variable Costs	432	227	446	222	399	203	422	232	411	250	435	244	Purdue Crop Guide
5	Contribution Margin	234	339	150	220	196	351	176	276	249	252	227	194	Line 3 - Line 4
6	Plus Government Pymt.	8		18		50		30		40		28		IN Ag. Stats. Service
7	Total Contribution Margin	290		194		299		241		270		224		Lines 5 + 6 / 2
	Less Overhead:													
8	Annual Machinery	115		119		122		123		125		130		Purdue Crop Guide
9	Drying/Handling													Purdue Crop Guide
10	Family/Hired Labor	78		93		91		81		65		78		Purdue Crop Guide
11	Real Estate Tax	27		31		31		30		29		26		DLGF Study
12	Net ReturnTo Land - Nov.	70		-49		55		7		51		-10		Line 7 - 8,9,10, 11

Sources: (pages references within this packet)

		2014	2015	2016	2017	2018	2019	
1	Yield per Acre	P-35	P-35	P-35	P-35	P-35	P-35	IN Ag. Stats. Service
2	Price per Bu. - November	P- 40 & 41	P- 40 & 41	P- 40 & 41	P- 40 & 41	P- 40 & 41	P- 40 & 41	IN Ag. Stats. Service
4	Less Variable Costs	P-45	P-48	P-51	P-54	P-57	P-60	Purdue Crop Guide
6	Plus Government Pymt.	P-63	P-63	P-63	P-63	P-63	P-63	IN Ag. Stats. Service
8	Annual Machinery	P-47	P-50	P-53	P-56	P-59	P-62	Purdue Crop Guide
9	Drying/Handling	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-62	Purdue Crop Guide
11	Real Estate Tax	P-25	P-25	P-25	P-25	P-25	P-25	DLGF Study

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	P-36
2015	150	P-36
2016	173	P-36
2017	180	P-36
2018	189	P-36
2019	165	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	P-38
2015	50	P-38
2016	57.5	P-38
2017	54	P-38
2018	58.5	P-38
2019	49	P-39

Source: Indiana Agricultural Statistics Service

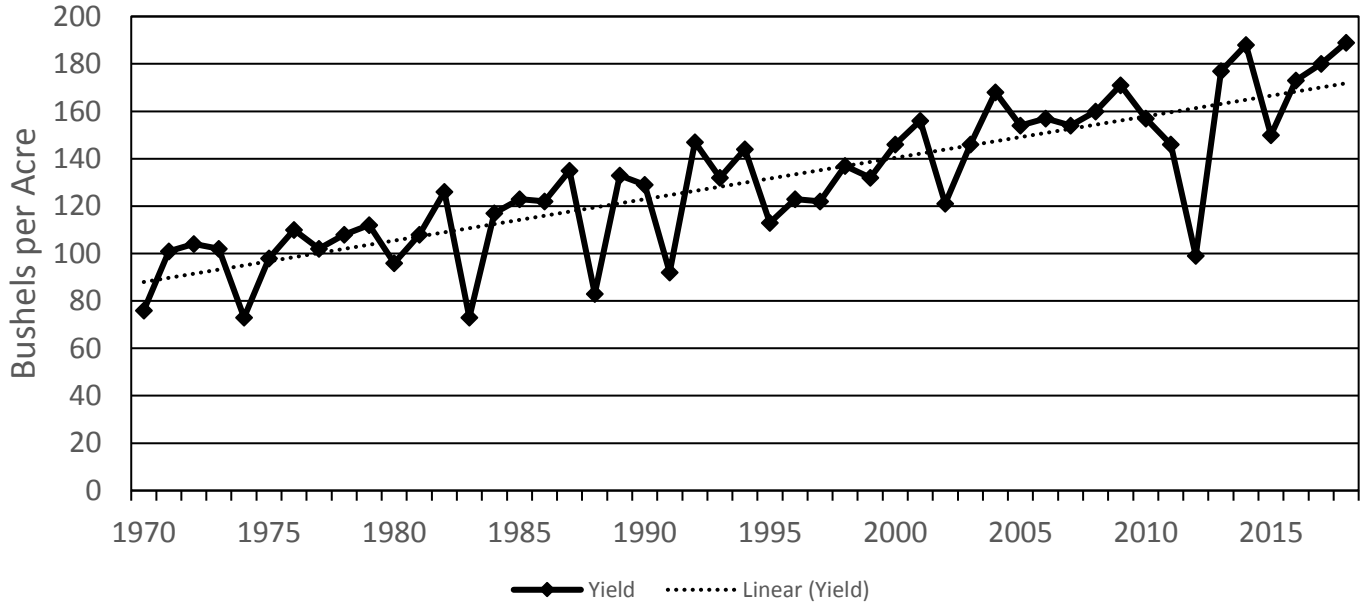
CROP SUMMARY

CORN FORECAST AND FINAL YIELD
INDIANA, 1995-2018

Year	August Forecast	September Forecast	October Forecast	November Forecast	Final Yield Per Acre
	Yield (Bu)	Yield (Bu)	Yield (Bu)	Yield (Bu)	(Bushels)
1995	135	125	119	116	113
1996	118	118	120	124	123
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**

[1] Data not available due to sequestration.

Corn Yield Trend
Indiana, 1970-2018



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	2019	YEAR		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	165	
SURVEY	2019	YEAR - AUG FORECAST		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	166	
SURVEY	2019	YEAR - NOV FORECAST		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	165	
SURVEY	2019	YEAR - OCT FORECAST		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	162	
SURVEY	2019	YEAR - SEP FORECAST		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	161	

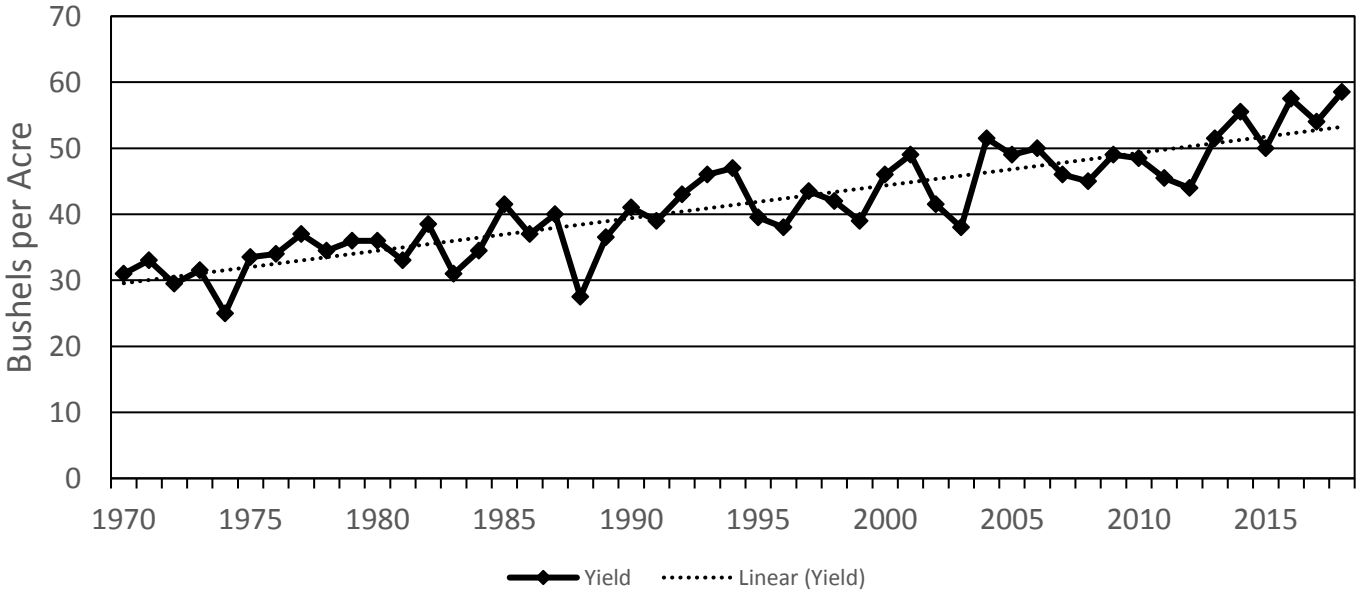
CROP SUMMARY

SOYBEAN FORECAST AND FINAL YIELD
INDIANA, 1995-2018

Year	August Forecast	September Forecast	October Forecast	November Forecast	Final Yield Per Acre
	Yield (Bu)	Yield (Bu)	Yield (Bu)	Yield (Bu)	(Bushels)
1995	43.0	44.0	40.0	39.0	39.5
1996	35.0	35.0	38.0	39.0	38.0
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**	**58.5**

[1] Data not available due to sequestration.

Soybean Yield Trend
Indiana, 1970-2018



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	2019	YEAR		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	49	
SURVEY	2019	YEAR - AUG FORECAST		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	50	
SURVEY	2019	YEAR - NOV FORECAST		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	49	
SURVEY	2019	YEAR - OCT FORECAST		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	48	
SURVEY	2019	YEAR - SEP FORECAST		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	49	

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	3.71	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	4.01	4.01	3.99	3.60

*Marketing average is Sept. of the previous year to Aug. in the current year.

Source: Pages 42 & 43 of this packet
Note: November & December 2019 Prices were not available at the time this calculation was made so the October 2019 price was used.

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	9.51	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	8.58	8.94	9.43	9.61
2019	8.94	8.91	8.83	8.57	8.39	8.71	8.80	8.60	8.6	8.94	8.94	8.94	8.76	8.75

*Marketing average is Sept. of the previous year to Aug. in the current year.

Source: Page 42 & 44 of this packet
Note: November & December 2019 prices were not available at the time this calculation was made so the October 2019 price was used.

CROP PRICES

MONTHLY PRICES RECEIVED BY FARMERS CROPS, INDIANA, 2012-2019 [1]

Year	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Marketing Year Avg.
Corn (Dollars per Bushel)													
2012-13	7.37	7.22	7.43	7.27	7.26	7.38	7.48	7.12	7.16	7.15	6.71	6.38	7.23
2013-14	5.11	4.34	4.17	4.37	4.49	4.48	4.68	4.86	4.91	4.63	4.07	3.88	4.47
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**	**3.71**	**3.76**	**3.79**	**3.78**	**3.69**	**3.81**	**4.29**	**4.55**	(2)	**3.60**
Soybeans (Dollars per Bushel)													
2012-13	14.80	14.50	14.60	14.50	14.60	14.80	15.00	14.70	15.10	15.60	15.80	14.90	14.70
2013-14	13.40	12.60	12.70	13.10	13.20	13.40	13.90	14.60	14.80	14.70	13.70	12.90	13.20
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**	**8.58**	**8.94**	**8.91**	**8.91**	**8.83**	**8.57**	**8.39**	**8.71**	**8.80**	(2)	**8.75**

Year	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Marketing Year Avg.
Wheat (Dollars per Bushel)													
2012-13	6.62	8.25	8.56	8.88	8.97	8.63	8.56	8.12	7.80	7.27	7.23	7.08	7.28
2013-14	6.75	6.54	6.15	6.29	6.05	6.44	6.22	6.11	6.09	6.07	6.33	6.24	6.42
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**

[1] Weighted monthly average for market year. 2018 and 2019 are preliminary.
[2] Data not available.

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	2019	JAN		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	3.76	
SURVEY	2019	FEB		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	3.79	
SURVEY	2019	MAR		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	3.75	
SURVEY	2019	APR		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	3.68	
SURVEY	2019	MAY		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	3.81	
SURVEY	2019	JUN		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	4.28	
SURVEY	2019	JUL		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	4.55	
SURVEY	2019	AUG		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	4.27	
SURVEY	2019	SEP		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	3.96	
SURVEY	2019	OCT		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	4.01	

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	2019	JAN		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	8.94	
SURVEY	2019	FEB		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	8.91	
SURVEY	2019	MAR		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	8.83	
SURVEY	2019	APR		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	8.57	
SURVEY	2019	MAY		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	8.39	
SURVEY	2019	JUN		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	8.71	
SURVEY	2019	JUL		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	8.8	
SURVEY	2019	AUG		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	8.6	
SURVEY	2019	SEP		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	8.6	
SURVEY	2019	OCT		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	8.94	

2014 Purdue Crop Cost & Return Guide

March 2014 Estimates

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

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

	Crop Budgets for Three Yield Levels[1]														
	Low Productivity Soil					Average Productivity Soil					High Productivity Soil				
	Cont. Corn	**Rot. Corn**	**Rot. Beans**	**Wheat**	**DC Beans**	**Cont. Corn**	**Rot. Corn**	**Rot. Beans**	**Wheat**	**DC Beans**	**Cont. Corn**	**Rot. Corn**	**Rot. Beans**	**Wheat**	**DC Beans**
Expected yield per acre[2]	122	130	43	56	30	153	163	54	70	38	184	196	65	84	46
Harvest price[3]	$4.60	$4.60	$11.40	$6.50	$11.40	$4.60	$4.60	$11.40	$6.50	$11.40	$4.60	$4.60	$11.40	$6.50	$11.40
Market revenue	$561	$598	$490	$364	$342	$704	$750	$616	$455	$433	$846	$902	$741	$546	$524
Less variable costs[4]															
Fertilizer[5]	$141	$127	$48	$64	$36	$151	$136	$58	$85	$43	$160	$146	$69	$106	$51
Seed[6]	96	96	71	44	81	118	118	71	44	81	118	118	71	44	81
Pesticides[7]	44	44	29	12	27	44	44	29	12	27	44	44	29	12	27
Dryer fuel[8]	24	19	N/A	N/A	3	30	24	N/A	N/A	4	36	29	N/A	N/A	5
Machinery fuel @ $3.66	27	27	16	17	12	27	27	16	17	12	27	27	16	17	12
Machinery repairs[9]	22	22	18	18	15	22	22	18	18	15	22	22	18	18	15
Hauling[10]	12	13	4	6	3	15	16	5	7	4	18	20	7	8	5
Interest[11]	11	11	6	5	6	12	12	7	6	6	7	6	7	7	6
Insurance/misc.[12]	32	33	23	3	4	32	33	23	3	4	32	33	23	3	4
Total variable cost	$409	$392	$215	$169	$187	$451	$432	$227	$192	$196	$464	$445	$240	$215	$206
Contribution margin[13] (Revenue - variable costs) per acre	$152	$206	$275	$195	$155	$253	$318	$389	$263	$237	$382	$457	$501	$331	$318

[1]Estimated 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.

[2]These 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 31%; 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.

[3]Harvest corn price is December 2014 CME Group futures price less $0.25 basis. Harvest soybean price is November 2014 CME Group futures price less $0.35 basis. Harvest wheat price is July 2014 CME Group futures price less $.35 basis. Harvest prices were based on closing prices on March 12, 2014. These prices will change.

Table 1 (Continued)

[4]Input prices for variable costs reflect expected prices for 2014. 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.

[5]Phosphate, 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, P_20_5, K_20, 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.: NH_3 @ $0.42; urea @ $0.46; P_20_5 @ $0.47; K_20 @ $0.40; 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.

[6]Corn 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.

[7]Includes 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.

[8]Fuel 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.

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

[10]Hauling charge represents moving grain from field to storage.

[11]Interest 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.

[12]The cost of crop insurance represents the premium estimated for a Revenue Coverage (RP) policy at the 75% level. Estimates were based on rates in 2013. Crop insurance is included in budgets for corn and full-season soybeans, but is not included for wheat and double-crop soybeans.

[13]Contribution 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

	Low Productivity Soil				Average Productivity Soil				High Productivity Soil			
Farm Acres	900	1000	2700	3000	900	1000	2700	3000	900	1000	2700	3000
Rotation[1]	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]	$152	$241	$152	$241	$253	$354	$253	$354	$382	$479	$382	$479
Government payment[3]	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total contribution margin	$152	$241	$152	$241	$253	$354	$253	$354	$382	$479	$382	$479
Annual overhead costs:												
Machinery ownership[4]	$128	$115	$102	$92	$128	$115	$102	$92	$128	$115	$102	$92
Family and hired labor[5]	$86	$78	$44	$39	$86	$78	$44	$39	$86	$78	$44	$39
Land[6]	$178	$178	$178	$178	$233	$233	$233	$233	$298	$298	$298	$298
Earnings or (losses)	-$240	-$130	-$172	-$68	-$194	-$72	-$126	-$10	-$130	-$12	-$62	$50

[1]Rotations 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.

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

[3]It is assumed that the upcoming farm bill will not contain a provision for direct payments or ACRE payments.

[4]The 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.

[5]For the larger acreages, labor expense includes a family living withdrawal of $77,965 ($88,430 of family living expenses less $38,257 in net nonfarm income plus $27,792 in income and self-employment taxes); a full-time employee with total compensation of $37,388; and a part-time employee with compensation of $3,225. 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.

[6]Based on 2013 cash rent per bushel of corn yield reported in the artcile entitled "Up Again: Indiana's Farmland Market in 2013," Purdue Agricultural Economics Report, August, 2013. The relatively large estimated contribution margins for 2014 will likely place upward pressure on 2014 cash rents.

Prepared by: Craig L. Dobbins, Michael R. Langemeier, and W. Alan Miller, 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: 3/12/14

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2015 Purdue Crop Cost & Return Guide

March 2015 Estimates

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

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

	Crop Budgets for Three Yield Levels[1]														
	Low Productivity Soil					Average Productivity Soil					High Productivity Soil				
	Cont. Corn	**Rot. Corn**	**Rot. Beans**	**Wheat**	**DC Beans**	**Cont. Corn**	**Rot. Corn**	**Rot. Beans**	**Wheat**	**DC Beans**	**Cont. Corn**	**Rot. Corn**	**Rot. Beans**	**Wheat**	**DC Beans**
Expected yield per acre[2]	124	132	40	57	28	155	165	50	71	35	186	198	60	85	42
Harvest price[3]	$3.90	$3.90	$9.40	$4.70	$9.40	$3.90	$3.90	$9.40	$4.70	$9.40	$3.90	$3.90	$9.40	$4.70	$9.40
Market revenue	$484	$515	$376	$268	$263	$605	$644	$470	$334	$329	$725	$772	$564	$400	$395
Less variable costs[4]															
Fertilizer[5]	$153	$137	$47	$63	$35	$163	$147	$57	$82	$42	$172	$156	$67	$102	$49
Seed[6]	100	100	74	44	85	123	123	74	44	85	123	123	74	44	85
Pesticides[7]	43	43	28	12	26	43	43	28	12	26	43	43	28	12	26
Dryer fuel[8]	31	24	N/A	N/A	3	38	30	N/A	N/A	4	46	37	N/A	N/A	5
Machinery fuel @ $2.50	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]	12	13	4	6	3	16	17	5	7	4	19	20	6	9	4
Interest[11]	12	11	6	5	6	13	12	6	6	6	6	6	7	6	6
Insurance/misc.[12]	32	33	23	3	4	32	33	23	3	4	32	33	23	3	4
Total variable cost	$424	$402	$211	$162	$185	$469	$446	$222	$183	$194	$482	$459	$234	$205	$202
Contribution margin[13] (Revenue - variable costs) per acre	$60	$113	$165	$106	$78	$136	$198	$248	$151	$135	$243	$313	$330	$195	$193

[1]Estimated 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.

[2]These 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.

[3]Harvest corn price is December 2015 CME Group futures price less $0.25 basis. Harvest soybean price is November 2015 CME Group futures price less $0.35 basis. Harvest wheat price is July 2015 CME Group futures price less $.35 basis. Harvest prices were based on closing prices on March 11, 2015. These prices will change.

Table 1 (Continued)

[4]Input prices for variable costs reflect expected prices for 2015. 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.

[5]Phosphate, 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, P_20_5, K_20, 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.: NH_3 @ $0.43; urea @ $0.52; P_20_5 @ $0.53; K_20 @ $0.40; 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.

[6]Corn 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.

[7]Includes 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.

[8]Fuel 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.

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

[10]Hauling charge represents moving grain from field to storage.

[11]Interest 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.

[12]The cost of crop insurance represents the premium estimated for a Revenue Coverage (RP) policy at the 75% level. Estimates were based on rates in 2014. Crop insurance is included in budgets for corn and full-season soybeans, but is not included for wheat and double-crop soybeans.

[13]Contribution 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

	Low Productivity Soil				Average Productivity Soil				High Productivity Soil			
Farm Acres	900	1000	2700	3000	900	1000	2700	3000	900	1000	2700	3000
Rotation[1]	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]	$60	$139	$60	$139	$136	$223	$136	$223	$243	$322	$243	$322
Government payment[3]	$60	$50	$60	$50	$60	$50	$60	$50	$60	$50	$60	$50
Total contribution margin	$120	$189	$120	$189	$196	$273	$196	$273	$303	$372	$303	$372
Annual overhead costs:												
Machinery ownership[4]	$133	$119	$106	$96	$133	$119	$106	$96	$133	$119	$106	$96
Family and hired labor[5]	$104	$93	$50	$45	$104	$93	$50	$45	$104	$93	$50	$45
Land[6]	$180	$180	$180	$180	$234	$234	$234	$234	$295	$295	$295	$295
Earnings or (losses)	-$297	-$204	-$216	-$131	-$274	-$174	-$194	-$101	-$228	-$136	-$148	-$63

[1]Rotations 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.

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

[3]It is assumed that the upcoming farm bill will provide ARC-County payments in 2015.

[4]The 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.

[5]For the larger acreages, labor expense includes a family living withdrawal of $79,095 ($89,711 of family living expenses less $38,811 in net nonfarm income plus $28,195 in income and self-employment taxes); a full-time employee with total compensation of $37,930; and a part-time employee with compensation of $3,272. 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.

[6]Based on 2014 cash rent per bushel of corn yield reported in the artcile entitled "A Time of Change: Indiana's Farmland Market in 2014," Purdue Agricultural Economics Report, August, 2014. The relatively low estimated contribution margins for 2015 will likely place downward pressure on 2015 cash rents.

Prepared by: Craig L. Dobbins, Michael R. Langemeier, and W. Alan Miller, 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: 3/12/15

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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

	Crop Budgets for Three Yield Levels[1]														
	Low Productivity Soil					Average Productivity Soil					High Productivity Soil				
	Cont. Corn	**Rot. Corn**	**Rot. Beans**	**Wheat**	**DC Beans**	**Cont. Corn**	**Rot. Corn**	**Rot. Beans**	**Wheat**	**DC Beans**	**Cont. Corn**	**Rot. Corn**	**Rot. Beans**	**Wheat**	**DC Beans**
Expected yield per acre[2]	124	132	40	57	28	155	165	50	71	35	186	198	60	85	42
Harvest price[3]	$3.60	$3.60	$8.90	$4.40	$8.90	$3.60	$3.60	$8.90	$4.40	$8.90	$3.60	$3.60	$8.90	$4.40	$8.90
Market revenue	$446	$475	$356	$251	$249	$558	$594	$445	$312	$312	$670	$713	$534	$374	$374
Less variable costs[4]															
Fertilizer[5]	$121	$108	$36	$49	$27	$128	$115	$43	$65	$32	$135	$123	$51	$80	$37
Seed[6]	100	100	74	44	85	123	123	74	44	85	123	123	74	44	85
Pesticides[7]	42	42	26	12	25	42	42	26	12	25	42	42	26	12	25
Dryer fuel[8]	23	19	N/A	N/A	3	29	23	N/A	N/A	4	35	28	N/A	N/A	5
Machinery fuel @ $1.73	13	13	8	8	6	13	13	8	8	6	13	13	8	8	6
Machinery repairs[9]	22	22	18	18	15	22	22	18	18	15	22	22	18	18	15
Hauling[10]	12	13	4	6	3	16	17	5	7	4	19	20	6	9	4
Interest[11]	10	10	6	4	5	12	11	6	5	6	12	11	6	5	6
Insurance/misc.[12]	32	33	23	3	4	32	33	23	3	4	32	33	23	3	4
Total variable cost	$375	$360	$195	$144	$173	$417	$399	$203	$162	$181	$433	$415	$212	$179	$187
Contribution margin[13] (Revenue - variable costs) per acre	$71	$115	$161	$107	$76	$141	$195	$242	$150	$131	$237	$298	$322	$195	$187

[1]Estimated 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.

[2]These 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.

[3]Harvest 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)

[4]Input 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.

[5]Phosphate, 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, P_20_5, K_20, 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.: NH_3 @ $0.35; urea @ $0.39; P_20_5 @ $0.43; K_20 @ $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.

[6]Corn 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.

[7]Includes 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.

[8]Fuel 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.

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

[10]Hauling charge represents moving grain from field to storage.

[11]Interest 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.

[12]The 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.

[13]Contribution 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

	Low Productivity Soil				Average Productivity Soil				High Productivity Soil			
Farm Acres	900	1000	2700	3000	900	1000	2700	3000	900	1000	2700	3000
Rotation[1]	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	$141	$219	$141	$219	$237	$310	$237	$310
Government payment[3]	$25	$25	$25	$25	$25	$25	$25	$25	$25	$25	$25	$25
Total contribution margin	$96	$163	$96	$163	$166	$244	$166	$244	$262	$335	$262	$335
Annual overhead costs:												
Machinery ownership[4]	$136	$122	$109	$98	$136	$122	$109	$98	$136	$122	$109	$98
Family and hired labor[5]	$101	$91	$49	$44	$101	$91	$49	$44	$101	$91	$49	$44
Land[6]	$161	$161	$161	$161	$213	$213	$213	$213	$269	$269	$269	$269
Earnings or (losses)	-$301	-$211	-$223	-$140	-$284	-$182	-$205	-$111	-$244	-$147	-$165	-$76

[1]Rotations 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.

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

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

[4]The 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.

[5]For 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.

[6]Based on 2015 cash rent per bushel of corn yield reported in the artcile 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

	Crop Budgets for Three Yield Levels[1]														
	Low Productivity Soil					Average Productivity Soil					High Productivity Soil				
	Cont. Corn	**Rot. Corn**	**Rot. Beans**	**Wheat**	**DC Beans**	**Cont. Corn**	**Rot. Corn**	**Rot. Beans**	**Wheat**	**DC Beans**	**Cont. Corn**	**Rot. Corn**	**Rot. Beans**	**Wheat**	**DC Beans**
Expected yield per acre[2]	128	136	42	60	29	160	170	52	75	36	192	204	62	90	43
Harvest price[3]	$3.70	$3.70	$9.60	$4.20	$9.60	$3.70	$3.70	$9.60	$4.20	$9.60	$3.70	$3.70	$9.60	$4.20	$9.60
Market revenue	$474	$503	$403	$252	$278	$592	$629	$499	$315	$346	$710	$755	$595	$378	$413
Less variable costs[4]															
Fertilizer[5]	$120	$107	$35	$51	$26	$127	$115	$42	$67	$31	$134	$122	$49	$83	$35
Seed[6]	98	98	71	44	82	119	119	71	44	82	119	119	71	44	82
Pesticides[7]	54	54	46	15	43	54	54	46	15	43	54	54	46	15	43
Dryer fuel[8]	30	24	N/A	N/A	4	38	30	N/A	N/A	5	45	36	N/A	N/A	5
Machinery fuel @ $2.02	15	15	9	9	6	15	15	9	9	6	15	15	9	9	6
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	20	6	9	4
Interest[11]	11	11	7	5	6	12	12	7	5	6	12	12	7	6	7
Insurance/misc.[12]	36	36	31	9	9	38	38	34	9	9	40	40	34	9	9
Total variable cost	$399	$381	$221	$157	$194	$441	$422	$232	$175	$201	$460	$440	$240	$193	$206
Contribution margin[13] (Revenue - variable costs) per acre	$75	$122	$182	$95	$84	$151	$207	$267	$140	$145	$250	$315	$355	$185	$207

[1]Estimated 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.

[2]These 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.

[3]Harvest 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)

[4]Input 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.

[5]Phosphate, 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, P_20_5, K_20, 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.: NH_3 @ $0.32; urea @ $0.39; P_20_5 @ $0.40; K_20 @ $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.

[6]Corn 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.

[7]Includes 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.

[8]Fuel 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.

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

[10]Hauling charge represents moving grain from field to storage.

[11]Interest 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.

[12]Includes 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.

[13]Contribution 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

	Low Productivity Soil				Average Productivity Soil				High Productivity Soil			
Farm Acres	900	1000	2700	3000	900	1000	2700	3000	900	1000	2700	3000
Rotation[1]	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	$250	$335	$250	$335
Government payment[3]	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total contribution margin	$75	$152	$75	$152	$151	$237	$151	$237	$250	$335	$250	$335
Annual overhead costs:												
Machinery ownership[4]	$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
Land[6]	$149	$149	$149	$149	$194	$194	$194	$194	$244	$244	$244	$244
Earnings or (losses)	-$301	-$201	-$230	-$137	-$270	-$161	-$199	-$97	-$221	-$113	-$150	-$49

[1]Rotations 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.

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

[3]It 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.

[4]The 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.

[5]For 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.

[6]Based 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

November 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

	Crop Budgets for Three Yield Levels[1]														
	Low Productivity Soil					Average Productivity Soil					High Productivity Soil				
	Cont. Corn	**Rot. Corn**	**Rot. Beans**	**Wheat**	**DC Beans**	**Cont. Corn**	**Rot. Corn**	**Rot. Beans**	**Wheat**	**DC Beans**	**Cont. Corn**	**Rot. Corn**	**Rot. Beans**	**Wheat**	**DC Beans**
Expected yield per acre[2]	130	138	43	61	30	162	172	53	76	37	194	206	63	91	44
Harvest price[3]	$3.60	$3.60	$9.70	$4.30	$9.70	$3.60	$3.60	$9.70	$4.30	$9.70	$3.60	$3.60	$9.70	$4.30	$9.70
Market revenue	$468	$497	$417	$262	$291	$583	$619	$514	$327	$359	$698	$742	$611	$391	$427
Less variable costs[4]															
Fertilizer[5]	$105	$95	$36	$51	$27	$112	$103	$43	$67	$32	$119	$111	$50	$83	$37
Seed[6]	91	91	67	44	78	111	111	67	44	78	111	111	67	44	78
Pesticides[7]	60	60	65	25	55	60	60	65	25	55	60	60	65	25	55
Dryer fuel[8]	31	25	N/A	N/A	4	38	31	N/A	N/A	5	46	37	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	10	7	5	6	12	11	7	6	7	12	12	8	6	7
Insurance/misc.[12]	36	36	31	9	9	38	38	34	9	9	40	40	34	9	9
Total variable cost	$387	$371	$239	$169	$205	$427	$411	$250	$188	$213	$447	$432	$259	$205	$218
Contribution margin[13] (Revenue - variable costs) per acre	$81	$126	$178	$93	$86	$156	$208	$264	$139	$146	$251	$310	$352	$186	$209

[1]Estimated 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.

[2]These 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.

[3]Harvest 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 November 27, 2017. These prices will change.

Table 1 (Continued)

[4]Input 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.

[5]Phosphate, 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, P_20_5, K_20, 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.: NH_3 @ $0.25; urea @ $0.37; P_20_5 @ $0.42; K_20 @ $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.

[6]Corn 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.

[7]Includes 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.

[8]Fuel 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.

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

[10]Hauling charge represents moving grain from field to storage.

[11]Interest 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.

[12]Includes 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.

[13]Contribution 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

	Low Productivity Soil				Average Productivity Soil				High Productivity Soil			
Farm Acres	900	1000	2700	3000	900	1000	2700	3000	900	1000	2700	3000
Rotation[1]	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]	$81	$152	$81	$152	$156	$236	$156	$236	$251	$331	$251	$331
Government payment[3]	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total contribution margin	$81	$152	$81	$152	$156	$236	$156	$236	$251	$331	$251	$331
Annual overhead costs:												
Machinery ownership[4]	$139	$125	$111	$100	$139	$125	$111	$100	$139	$125	$111	$100
Family and hired labor[5]	$72	$65	$41	$37	$72	$65	$41	$37	$72	$65	$41	$37
Land[6]	$151	$151	$151	$151	$195	$195	$195	$195	$246	$246	$246	$246
Earnings or (losses)	-$281	-$189	-$222	-$136	-$250	-$149	-$191	-$96	-$206	-$105	-$147	-$52

[1]Rotations 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.

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

[3]It 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.

[4]The 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.

[5]For the larger acreages, labor expense includes a family living withdrawal of $64,957 ($84,455 of family living expenses less $45,290 in net nonfarm income plus $26,192 in income and self-employment taxes); a full-time employee with total compensation of $41,723; and a part-time employee with compensation of $3,599. 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.

[6]Based 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.

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: 11/27/17

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2019 Purdue Crop Cost & Return Guide

December 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**	**Rot. Beans**	**Wheat**	**DC Beans**	**Cont. Corn**	**Rot. Corn**	**Rot. Beans**	**Wheat**	**DC Beans**	**Cont. Corn**	**Rot. Corn**	**Rot. Beans**	**Wheat**	**DC Beans**
Expected yield per acre[2]	131	139	43	61	30	164	174	54	77	38	196	209	65	92	46
Harvest price[3]	$3.80	$3.80	$9.20	$5.00	$9.20	$3.80	$3.80	$9.20	$5.00	$9.20	$3.80	$3.80	$9.20	$5.00	$9.20
Market revenue	$498	$528	$396	$305	$276	$623	$661	$497	$385	$350	$745	$794	$598	$460	$423
Less variable costs[4]															
Fertilizer[5]	$128	$116	$42	$61	$31	$137	$126	$51	$81	$38	$146	$135	$60	$100	$45
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]	31	25	N/A	N/A	4	39	31	N/A	N/A	5	46	37	N/A	N/A	6
Machinery fuel @ $2.72	20	20	12	12	9	20	20	12	12	9	20	20	12	12	9
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]	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	$410	$393	$231	$186	$200	$453	$435	$244	$208	$210	$476	$456	$255	$229	$219
Contribution margin[13] (Revenue - variable costs) per acre	$88	$135	$165	$119	$76	$170	$226	$253	$177	$140	$269	$338	$343	$231	$204

[1]Estimated 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.

[2]These 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.

[3]Harvest 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 December 5, 2018. These prices will change.

Table 1 (Continued)

[4]Input 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.

[5]Phosphate, 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, P_20_5, K_20, 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.: NH_3 @ $0.32; urea @ $0.45; P_20_5 @ $0.50; K_20 @ $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.

[6]Corn 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.

[7]Includes 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.

[8]Fuel 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.

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

[10]Hauling charge represents moving grain from field to storage.

[11]Interest 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.

[12]Includes 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.

[13]Contribution 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

	Low Productivity Soil				Average Productivity Soil				High Productivity Soil			
Farm Acres	900	1000	2700	3000	900	1000	2700	3000	900	1000	2700	3000
Rotation[1]	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]	$88	$150	$88	$150	$170	$240	$170	$240	$269	$341	$269	$341
Government payment[3]	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total contribution margin	$88	$150	$88	$150	$170	$240	$170	$240	$269	$341	$269	$341
Annual overhead costs:												
Machinery ownership[4]	$138	$130	$85	$80	$138	$130	$85	$80	$138	$130	$85	$80
Family and hired labor[5]	$87	$78	$47	$42	$87	$78	$47	$42	$87	$78	$47	$42
Land[6]	$164	$164	$164	$164	$208	$208	$208	$208	$264	$264	$264	$264
Earnings or (losses)	-$301	-$222	-$208	-$136	-$263	-$176	-$170	-$90	-$220	-$131	-$127	-$45

[1]Rotations 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.

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

[3]It 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.

[4]The 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.

[5]For 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.

[6]Based 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: 12/5/18

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Calculation of Average Government Payments per Acre January 1, 2020

Line #		2014	2015	2016	2017	2018
1	Total Government Payment	106,856,000	220,742,000	624,674,000	373,228,000	516,224,000
2	Less Milk Income Loss Payment	0	-1,000	0	0	0
3	Less Dairy Margin Protection	0	-9,000	-202,000	0	-3,638,000
4	Net Government Payment	106,856,000	220,732,000	624,472,000	373,228,000	512,586,000
5	Cropland Acres	12,590,633	12,590,633	12,590,633	12,590,633	12,909,673
6	Pymt Per Acre	8.49	17.53	49.60	29.64	39.71

Source: USDA-Indiana Ag Statistics Service

		2014	2015	2016	2017	2018
1	Total Government Payment	P-65	P-65	P-65	P-65	P-65
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-68	P-68	P-66

Data for 2019 is not currently available. The Department has estimated the Government Payment per Acre for 2019 in the following way.

Average Total Government Payment (2014-2018)	368,344,800
Average Milk Income Loss Payment (2014-2018)	-200
Average Dairy Margin Protection Pymt (2014-2018)	-769,800
Estimated Net Government Payment for 2019	367,574,800
Cropland Acres (P-66)	12,909,673
Estimated Payment Per Acre for 2019	28.47

INDIANA

AGRICULTURAL STATISTICS 2018-2019

FARM INCOME

FARM PRODUCTION EXPENSES, BY CATEGORY, INDIANA, 2014-2018 [1]

Item	2014	2015	2016	2017	**2018**
			Thousand Dollars		
Total Production Expenses	10,996,404	10,550,804	10,725,575	10,212,390	**10,080,014**
Intermediate Product Expenses					
Farm-origin Expenses	2,421,091	2,742,299	2,665,413	2,510,889	**2,457,958**
Feed Purchases	1,110,000	1,410,000	1,450,000	1,150,000	**1,130,000**
Livestock and Poultry	301,091	382,299	255,413	370,889	**387,958**
Seed Purchases	1,010,000	950,000	960,000	990,000	**940,000**
Manufactured Inputs	2,454,416	2,153,720	2,062,254	2,009,080	**2,150,280**
Pesticide Expenditures	550,000	500,000	560,000	560,000	**560,000**
Fertilizer, Lime, and Soil Conditioner	1,290,000	1,200,000	1,060,000	960,000	**1,080,000**
Fuels and Oils	507,548	353,712	315,587	377,194	**394,785**
Electricity	106,868	100,008	126,667	111,886	**115,495**
Labor Expenses					
Cash Expenses	492,368	398,011	441,254	479,917	**502,668**
Contract Labor	27,809	23,181	36,237	26,356	**16,363**
Hired Labor and Employee Compensation	464,559	374,830	405,017	453,561	**486,304**
Non-cash Employee Compensation	17,632	11,989	8,746	20,083	**17,332**
Interest Expenses	482,527	502,099	532,285	620,033	**685,510**
Net Rent, Including Landlord Capital Consumption	1,156,651	1,080,473	1,249,337	1,111,251	**978,181**
Property Taxes and Fees	547,627	506,088	435,711	462,678	**536,821**
Personal Property Taxes	50,154	39,505	32,386	48,450	**33,351**
Motor Vehicle Registration and Licensing Fees	27,627	26,088	25,711	27,678	**26,821**
Real Estate	469,846	440,495	377,614	386,550	**476,649**
Capital Consumption	1,720,535	1,418,593	1,545,847	1,206,922	**1,045,439**

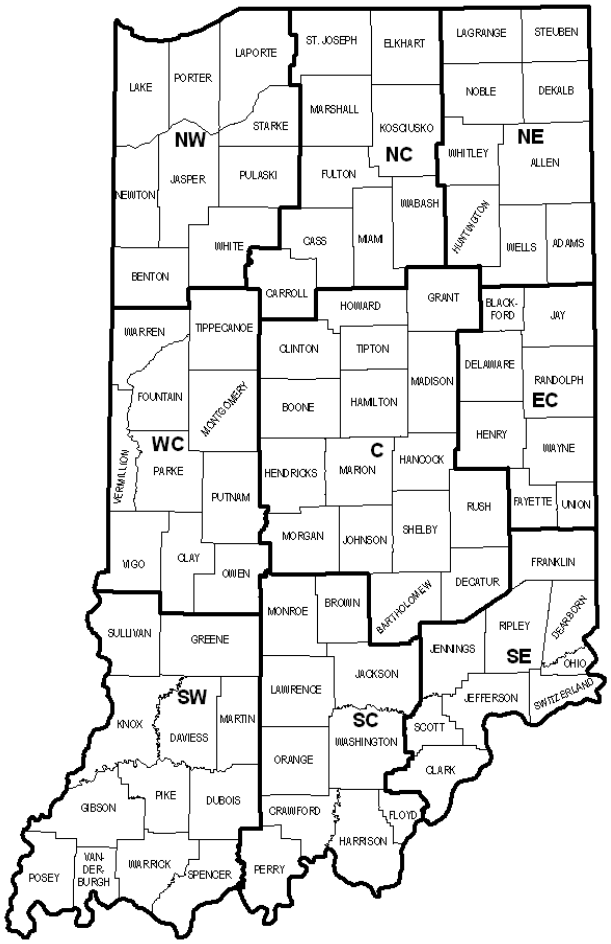
Data as of August 30, 2019
[1] All data includes Operator Dwellings
Source: Economic Research Service

U.S. GOVERNMENT DIRECT FARM PROGRAM PAYMENTS BY PROGRAM, INDIANA, 2014-2018 [1 2 3]

Program	2014	2015	2016	2017	**2018**
			Thousand Dollars		
Fixed Direct Payments	526	(239)	42	0	**(13)**
Cotton Ginning Cost-Share (CGCS) Program	NA	NA	9	0	**8**
Average Crop Revenue Election Program (ACRE)	(4)	(3)	6	0	**0**
Price Loss Coverage (PLC)	NA	0	2,498	8,700	**7,764**
Agricultural Risk Coverage (ARC)	NA	148,676	539,282	285,888	**50,301**
Milk Income Loss Payments	0	1	0	0	**0**
Dairy Margin Protection Program	NA	9	202	0	**3,638**
Tobacco Transition Payments	5,402	11	0	0	**0**
Conservation	70,838	69,826	73,219	77,745	**87,747**
Supplemental and ad hoc disaster assistance	30,093	2,461	9,416	790	**847**
Miscellaneous Programs [4]	0	0	0	105	**365,931**
Total	106,856	220,742	624,674	373,228	**516,224**

Data as of August 30, 2019
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 Facilitated Programs.
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 2018 harvest season. In addition to these data are selected items of interest from the U.S. Population Census, 2017 Census of Agriculture, and 2017 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

2017 Census Population	6,666,818
2017 Total Land Area (acres)	22,928,355
2017 Number of Farms	56,649
2017 Land in Farms (acres)	14,969,996
2017 Average Size of Farm (acres)	264
2017 Value of Land & Bldgs (avg/acre)	$6,576
2017 Cropland (acres)	12,909,673
2017 Harvested Cropland (acres)	12,345,774
2017 Pastureland, all types (acres)	716,911
2017 Woodland (acres)	1,034,784

2017 Cash Receipts	$10,972,608,000
Crop Receipts	$6,919,471,000
Livestock Receipts	$4,053,137,000
2017 Other Income	$1,051,061,000
Government Payments	$373,229,000
Imputed Income/Rent Received	$677,832,000
2017 Total Income	$12,023,669,000
Less: Production Expenses	$11,138,139,000
Realized Net Income	$885,530,000

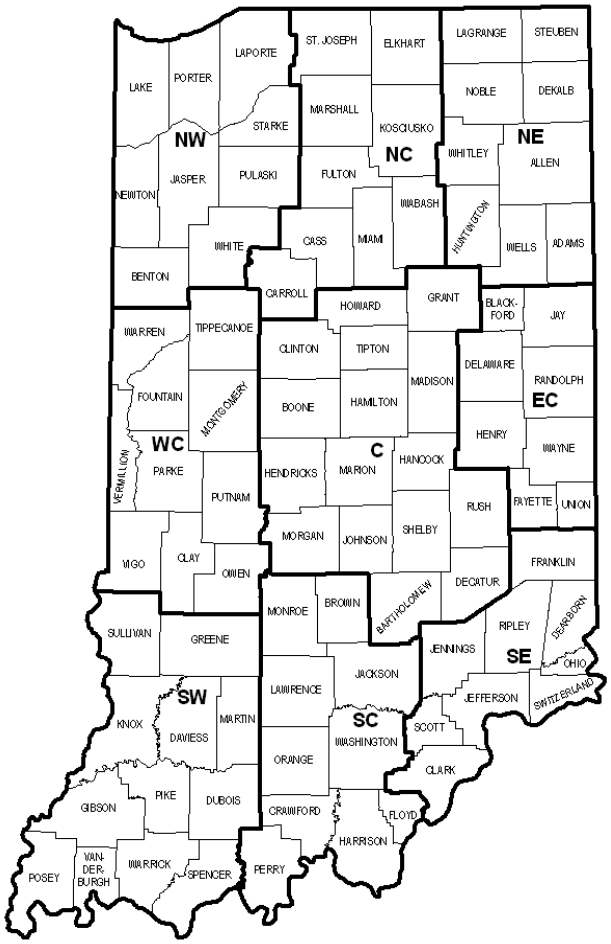
2018 CROPS	PLTD	HARV	YLD	UNIT	PROD
Corn	5,350,000	5,200,000	189.0	Bu	982,800,000
Soybeans	5,950,000	5,920,000	58.5	Bu	346,320,000
Wheat	310,000	260,000	71.0	Bu	18,460,000
Alfalfa Hay	---	240,000	3.00	Ton	720,000
Other Hay	---	270,000	2.45	Ton	662,000
2017 Popcorn	---	79,222	---	Lbs	352,386,717

LIVESTOCK	NUMBER HEAD
Jan 2019 All Cattle	880,000
Beef Cows	209,000
Milk Cows	181,000
2017 All Hogs	4,004,388
2017 All Sheep	62,085
2017 Chickens	26,354,377
2017 Turkeys	7,350,556

INDIANA

AGRICULTURAL STATISTICS 2017-2018

COUNTY HIGHLIGHTS



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

STATE DATA

2016 Census Population	6,619,680
2012 Total Land Area (acres)	22,928,756
2012 Number of Farms	58,695
2012 Land in Farms (acres)	14,720,396
2012 Average Size of Farm (acres)	251
2012 Value of Land & Bldgs (avg/acre)	$5,354
2012 Cropland (acres)	12,590,633
2012 Harvested Cropland (acres)	12,146,538
2012 Pastureland, all types (acres)	762,619
2012 Woodland (acres)	1,048,632

2016 Cash Receipts	$10,122,960,000
Crop Receipts	$6,536,930,000
Livestock Receipts	$3,586,030,000
2016 Other Income	$1,540,497,000
Government Payments	$648,105,000
Imputed Income/Rent Received	$892,392,000
2016 Total Income	$11,663,457,000
Less: Production Expenses	$10,320,505,000
Realized Net Income	$1,342,952,000

2017 CROPS	PLTD	HARV	YLD	UNIT	PROD
Corn	5,350,000	5,190,000	180.0	Bu	934,200,000
Soybeans	5,950,000	5,940,000	54.0	Bu	320,760,000
Wheat	290,000	240,000	74.0	Bu	17,760,000
Alfalfa Hay	---	270,000	3.30	Ton	891,000
Other Hay	---	310,000	2.40	Ton	744,000
2012 Popcorn	---	61,092	---	Lbs	151,728,996

LIVESTOCK	NUMBER HEAD
Jan 2018 All Cattle	870,000
Beef Cows	208,000
Milk Cows	187,000
2012 All Hogs	3,747,352
2012 All Sheep	52,169
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

SPRING, 2018	SUMMER, 2018	FALL, 2018	WINTER, 2018	SPRING, 2019	SUMMER, 2019
Planting 2018 crops Sell a portion of the 2017 crops Paying 1/1/17 Property Taxes Collect all or a portion of 2018 Cash Rent	Care for 2018 crops Sell remainder of the 2017 crops	Harvest 2018 crops Sell a portion of the 2018 crops Paying 1/1/17 Property Taxes Collect remainder of 2018 Cash Rent, if any due	Prep equipment for storage Sell a portion of the 2018 crops	Planting 2019 crops Sell a portion of the 2018 crops Paying 1/1/18 Property Taxes Collect all or a portion of 2019 Cash Rent	Care for 2019 crops Sell remainder of the 2018 crops

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