STATE OF INDIANA

DEPARTMENT OF LOCAL GOVERNMENT FINANCE

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REFERENCE MATERIALS FOR VALUING AGRICULTURAL LAND FOR JANUARY 1, 2021

BASE RATE - $1,290

Index

General Notes for the Agricultural Land Market
Value in Use for January 1, 2021 Rate of $1,290

December 2020

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 the 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 was calculated to be $1,050 and remained unchanged for 2003 and 2004.

Pursuant to 50 IAC 27-6-1(a), the department issued the annual rate for March 1, 2005, to be $880. In the 2005 legislative session, SEA 327 was passed. This bill contained a non-code provision that set the base rate for agricultural land for both March 1, 2005, and March 1, 2006, at $880. SEA 327 also contained language for March 1, 2007, which instructed the Department of Local Government Finance ("Department") to adjust the 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 were 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.
- The base rate for January 1, 2021, was updated by removing the 2014 data, adding the 2020 data, excluding the highest year (2020) of the six-year average, and adjusting the capitalization rates per SEA 308-2016 to arrive at a final base rate of $1,290.

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, 2021

Table 2-18 – Years:
For January 1, 2021, the six years of data used in the calculations were: 2015, 2016, 2017, 2018, 2019, and 2020.

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

The data for cash rents came from three Purdue Agricultural Economics Reports (PAER). For the 2015 & 2016 rents, go to Table 4 of Page 7 (P-19) of the August of 2016 report. For the 2017 & 2018 rents, go to Table 4 on Page 8 (P-21) of the August of 2018 report. For the 2019 & 2020 rents, go to Table 4 on Page 6 (P-23) of the July of 2020 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.

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

Doster/Huie Report – Table 1-Yields:
The yields in this report were obtained from the Indiana Agricultural Statistics Service (IASS) for both corn and soybeans. The IASS publishes these statistics on an annual basis. Yield information for these four years can be found in the 1999-2000 publication for corn on page 31 in the Final Yield per Acre column of the Crop Summary section and on page 32 for soybeans.

Doster/Huie Report – Table 1-Prices:
The prices used in this report were for the month of November. They can be found in IASS publications. Note: The Department adjusted this part of the calculation because the majority of the grain harvested in Indiana is not sold in November but throughout the year. This adjustment will be discussed later.

Doster/Huie Report – Table 1-Sales:
Yields for each type of crop (corn/soybeans) multiplied by the Price per Bushel for each type of crop equals Sales.

Doster/Huie Report – Table 1-Less Variable Costs:
This information can be found in the Purdue Crop Guide. This guide is an annual publication (ID-166). The dollar amount for each crop type can be found in the section titled "Estimated XXXX (year) Per Acre Production Costs in the column for Corn/Soybean Rotation for Average Soil. See the line for "Total direct cost per acre at harvest". The costs include labor, seed, fertilizer, chemicals, machinery repairs, and fuel.

Doster/Huie Report – Table 1-Crop Contribution Margin:
Sales less Variable Costs equal Crop Contribution Margin for each type of crop (corn/soybeans).

Doster/Huie Report – Table 1-Plus Government Payment:
The publication adds government payments as a source of additional revenue for the land. This amount for each year was estimated by the authors of the publication.

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

Doster/Huie Report – Table 1-Less Overhead:
The overhead expense for machinery, drying/handling, & family/hired labor can be found on the Purdue Crop Guide (ID-166). The dollar amount for each crop type can be found in the section titled "Estimated 20___ (year) Per Acre Production Costs in the column for Corn/Soybean Rotation for Average Soil. See the lines for "Indirect charges per acre".

Doster/Huie Report – Table 1-Real Estate Tax:
A deduction of $10 for real estate taxes was estimated by the authors.

Doster/Huie Report – Table 1-Income:
Total Contribution Margin less the Overhead Expenses of machinery, drying/handling, labor, & real estate taxes equal Income.

Doster/Huie Report – Table 1-Estimated Land Value:
The authors of the paper then averaged the four years (1996 – 1999) income and divided it by a 1999 interest rate to arrive at an Estimated Land Value of $971.

Table 2-18 – Net Income from Operating:
This income represents the profits from the owner-occupied production of crops on agricultural land. While the foundation for the calculations that the Department adopted comes from Table 1 of June 24, 1999, Doster/Huie report, we did make some alterations to it.

Adjustments Made to The Doster/Huie Report by the Department:

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

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

Summary of January 1, 2021, Base Rate:

The Department first calculated Table 2-18 Base Rate with data for the years of 2015, 2016, 2017, 2018, 2019, and 2020. Next, the highest market value-in-use for one of the years (2020) in the six-year rolling average was eliminated from the calculation. Then the implementation of Senate Enrolled Act 308-2016 determined the capitalization rates of 8% which lowered the Preliminary Table 2-18 Base Rate of $2,020 to a Final Base Rate of $1,290. (Refer to page 15 of this packet for a detailed comparison.)

Note: A simple explanation for the small increase from last year's base rate of $1,280 to this year's rate of $1,290 is that the data for 2014 dropped off of the six-year rolling average this year and the data for 2020 was added. By coincidence, both the 2014 data used in last year's calculation and the 2020 data used in this year's calculation were the highest market value-in-use of those six-year periods and by statute were excluded from the calculations. This means the same five years of data (2015, 2016, 2017, 2018, & 2019) were used to determine each of these base rates. The $10 increase is attributable to the data being revised or updated by the agencies publishing the source documents containing the data used in the calculations.

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 2021

This memorandum hereby serves to notify assessing officials of the agricultural base rate to be used for the January 1, 2021 assessment date: **$1,290 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 2021 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.

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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 (2015 to 2020) 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
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	55	8.00%	2,263	688	1,475
2019	181	6	8.00%	2,263	75	1,169
~~2020~~	~~192~~	~~106~~	~~8.00%~~	~~2,400~~	~~1,325~~	~~1,863~~

Average Market Value in Use	**$1,290**

The statewide agricultural land base rate value for the 2021 assessment year will be $1,290 per acre.

Dated this 31st day of December 2020.

Wesley R. Bennett

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, 2021
Senate Enrolled Act 308 - Assignment of Capitalization Rate To Determine Final Base Rate Per IC 6-1.1-4-4.5 (e)

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

	NET INCOMES PER ACRE		RATE	MARKET VALUE IN USE PER ACRE		AVERAGE MARKET VALUE IN USE
Year	Cash Rent	Owner-Operated	Cap. Rate	Cash Rent	Owner-Operated	PER ACRE
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	55	5.58%	3,244	986	2,115
2019	181	6	5.53%	3,273	108	1,691
2020	~~192~~	~~106~~	~~4.54%~~	~~4,229~~	~~2,335~~	~~3,282~~

Preliminary Table 2-18 Base Rate (Average - 5 Lowest Years): 2,020

Determination of SEA 308 Capitalization Rate:

Prior Year's Final Base Rate	1,280	IC 6-1.1-4-4.5 (e) (4) (See statute for exact language)
Current Year's Preliminary Base Rate	2,020	(A.) If there is an increase of 10% or more, the rate will be 8%.
Percent Difference	57.8%	(B.) If there is a decrease of 10% or more, the rate will be 6%.
		(C.)If neither (A.) or (B.) applies, the rate will be 7%.
SEA 308 Capitalization Rate To Use:	8%	

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

	NET INCOMES PER ACRE		RATE	MARKET VALUE IN USE PER ACRE		AVERAGE MARKET VALUE IN USE
Year	Cash Rent	Owner-Operated	Cap. Rate	Cash Rent	Owner-Operated	PER ACRE
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	55	8.00%	2,263	688	1,475
2019	181	6	8.00%	2,263	75	1,169
2020	~~192~~	~~106~~	~~8.00%~~	~~2,400~~	~~1,325~~	~~1,863~~

SEA 308 Final Base Rate (Average - 5 Lowest Years): 1,290

Table 2-18 - Updated for January 1, 2021
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	
Year	Cash Rent		Owner-Operated		Cap. Rate		Cash Rent	Owner-Operated	PER ACRE	
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	55	P-33	5.58%	P-26	3,244	986	2,115	(1)
2019	181	P-17	6	P-33	5.53%	P-26	3,273	108	1,691	(1)
2020	~~192~~	P-17	~~106~~	P-33	~~4.54%~~	P-26	~~4,229~~	~~2,335~~	~~3,282~~	(1)
								Base Rate (Average - 5 Lowest Years)	2,020	(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 Divided By The Capitalization Rate

Table 2-18 - Updated for January 1, 2021
Calculation for Net Income-Cash Rent Column

Year	Gross Cash Rent		Less Property Taxes		Net Cash Rent	Cap. Rate		Cash Rent Value
2015	229	P-19	-31	P-25	198	4.74%	P-26	4,177
2016	204	P-19	-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-21	-29	P-25	181	5.58%	P-26	3,244
2019	207	P-23	-26	P-25	181	5.53%	P-26	3,273
2020	217	P-23	-25	P-25	192	4.54%	P-26	4,229

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NEWS STRAIGHT FROM THE EXPERTS.

AUGUST 2016

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INDIANA FARMLAND VALUES AND CASH RENTS CONTINUE DOWNWARD ADJUSTMENTS

CRAIG DOBBINS, PROFESSOR OF AGRICULTURAL ECONOMICS
KIM COOK, INSTRUCTOR OF AGRICULTURAL ECONOMICS

The agricultural press is devoting a significant amount of time to the low commodity prices and the corresponding decline in net farm income. The major decline in margins associated with Midwest crop production continues to ripple through the broader agriculture production sector. The effect of these low margins continue to show up in lower farmland values and cash rents. The Iowa farmland value survey reported an 8.9% decline in 2014. A second decline of 3.9% was reported in 2015. The Ag Letter published by the Chicago Federal Reserve Bank reported district declines of 3% in farmland values in both 2014 and 2015. The 2014 Purdue Farmland Value survey indicated Indiana's farmland values were at a peak. In 2015, there was a state-wide decline of farmland values of about 5%. The 2016 Purdue Farmland Value Survey indicates a state wide decline of 8.2% to 8.7% (Table1). Declines of this size have not been seen since the mid-80s[1].

[1] 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

Table 3. Projected five-year average corn and soybean prices, mortgage interest, and inflation

	Price $ per bu.		Rate % per year	
Year	Corn	Beans	Interest	Inflation
2012	5.56	12.04	5.2%	3.1%
2013	5.52	12.16	5.1%	2.7%
2014	4.70	12.02	5.0%	2.7%
2015	4.02	9.76	5.0%	2.4%
2016	4.03	10.03	4.8%	2.3%
Average	$4.77	$11.20	5.0%	2.6%

accounted for 40% of the respondents. The remaining 57% of the respondents expect cash rent to be lower in 2017. The average decline for the group was 8.3%. Respondents expectations ranged from a decrease of 1% to 35%. The average across all respondents was for a decline of 4.5%.

As with farmland, these expectations indicate a continued decline in the rental market. If cash rent declines in 2017, it will be the third decline in a row. There has not been a period of three consecutive declines in cash rents since the 1980s.

Table 4. Average estimated Indiana cash rent per acre, (tillable, bare land) 2015 and 2016, Purdue Land Value Survey, June 2016

			Rent/Acre		Change	Rent/bu. of Corn		Rent as % of June Land Value	
Area	Land Class	Corn Bu./A	2015 $/A	2016 $/A	'15-'16 %	2015 $/bu.	2016 $/bu.	2015 %	2016 %
North	Top	202	284	260	-8.5%	1.41	1.29	3.1	3.2
	Average	166	227	202	-11.0%	1.35	1.22	3.0	3.0
	Poor	128	167	148	-11.4%	1.23	1.16	3.0	2.9
Northeast	Top	188	262	236	-9.9%	1.37	1.26	2.9	2.7
	Average	162	203	192	-5.4%	1.26	1.19	2.7	2.7
	Poor	132	156	150	-3.8%	1.20	1.14	2.6	2.6
W. Central	Top	211	334	296	-11.4%	1.57	1.40	3.4	3.0
	Average	182	281	241	-14.2%	1.54	1.32	3.3	2.9
	Poor	155	224	193	-13.8%	1.44	1.25	3.4	3.0
Central	Top	198	296	271	-8.4%	1.47	1.37	3.2	3.0
	Average	170	241	221	-8.3%	1.39	1.30	3.0	2.9
	Poor	143	188	177	-5.9%	1.31	1.24	3.0	3.0
Southwest	Top	201	278	273	-1.8%	1.36	1.36	2.7	3.0
	Average	163	216	210	-2.8%	1.29	1.29	2.7	3.0
	Poor	124	149	149	0.0%	1.20	1.20	2.9	3.2
Southeast	Top	191	202	199	-1.5%	1.10	1.04	3.6	3.5
	Average	153	152	147	-3.3%	1.01	0.96	3.2	3.3
	Poor	111	118	111	-5.9%	1.04	1.00	2.8	3.3
Indiana	Top	198	285	257	-9.8%	1.43	1.30	3.1	3.0
	Average	166	229	204	-10.9%	1.36	1.23	3.0	2.9
	Poor	134	175	157	-10.3%	1.28	1.17	3.0	2.9

[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.

COMBINING FARMLAND VALUES AND CASH RENT

One of the principles of economics and finance is that capital assets derive their value from the net cash return generated by the asset. The simplest form of this relationship can be expressed as $V = E \div C$, E represents the net annual earnings from the asset, C represents the capitalization rate. The capitalization rate is influenced by interest rates, risk premiums associated with being a landowner, expected rates of inflation, and expected growth rates in the net return. V is the expected value of the asset.

Doing a few algebraic manipulations, the

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2018 INDIANA FARMLAND VALUES - UP, DOWN, & SIDEWAYS

CRAIG DOBBINS, PROFESSOR OF AGRICULTURAL ECONOMICS

The direction of change in Midwest farmland value has been a challenge to discern. In Iowa, the December 2017 report indicated the average value of farmland had stopped declining and increased 2% from 2016. The March 2018 Nebraska report indicated the average market value of farmland declined by 3% compared to the year earlier value. The February 2018 Minnesota report showed a statewide farmland sales prices declined by 8%. The quarterly report by the Chicago Federal Reserve Bank issued May 2018 indicated a 1% decline in Illinois for the period of April 1, 2017 to April 1, 2018. This survey reported a 3% increase for this period in Indiana, a 2% increase in Iowa, and a 3% increase in Wisconsin. For the entire district, farmland values were stable.

These reports illustrate your experience with changes in farmland values is likely to depend on where you are located. The 2018 Purdue Farmland Value Survey[1] also indicates a mixture of increases and decreases in Indiana farmland values and cash rents.

On a statewide basis, June year-to-year farmland value comparisons indicate an uptick for top, average, and poor quality farmland. For the state as a whole, the strongest percent increase was for poor land, increasing 2.4%. Top and average quality farmland rose by 1.6% and 2.1%, respectively (Table 1). Rounding these changes to the nearest percent indicates a 2% statewide increase for each land quality. If one is willing to associate the word modest with these increases, these results indicate the downward adjustment in farmland values may be over.

The 2018 changes in farmland values across regions of the state and quality of farmland was a mixture of increases and decreases. Statewide top quality land had a value of $8,668 per acre, average quality land

[1]This information is a summary of data collected June 2018 as part of the Purdue Farmland Value Survey.

Northeast, Central, Southwest, and Southeast regions were a combination of increases and decreases.

The difference in cash rent per bushel across land quality continues to be small. For the state as a whole, the difference across farmland quality is only $0.09 per bushel.

The largest regional difference in cash rent per bushel across land quality was $0.14 in the Southwest region and $0.13 in the Northeast. The smallest was $0.05 and $0.06 in the Central and North region, respectively.

On a statewide basis, rent as a percent of land value remains around 3% (Table 4 and Figure 4). This is

Table 4. Average estimated Indiana cash rent per acre, (tillable, bare land) 2017 and 2018, Purdue Land Value Survey, June 2018

			Rent/Acre		Change	Rent/bu. of Corn		Rent as % of June Land Value	
Area	Land Class	Corn bu./A	2017 $/A	2018 $/A	'17-'18 %	2017 $/bu.	2018 $/bu.	2017 %	2018 %
North	Top	208	249	263	5.6%	1.23	1.26	3.0	3.1
	Average	174	205	210	2.4%	1.20	1.21	3.0	2.9
	Poor	139	159	167	5.0%	1.14	1.20	3.2	3.2
Northeast	Top	192	228	233	2.2%	1.16	1.21	2.7	2.8
	Average	166	187	192	2.7%	1.11	1.16	2.6	2.8
	Poor	142	150	153	2.0%	1.12	1.08	2.6	2.8
W. Central	Top	212	279	297	6.5%	1.35	1.40	2.8	3.1
	Average	185	235	245	4.3%	1.30	1.32	2.9	3.1
	Poor	154	193	199	3.1%	1.25	1.29	3.0	3.2
Central	Top	204	273	273	0.0%	1.39	1.34	3.1	3.0
	Average	175	220	228	3.6%	1.32	1.30	2.9	3.0
	Poor	146	179	188	5.0%	1.28	1.29	3.1	3.0
Southwest	Top	212	257	263	2.3%	1.24	1.24	2.8	3.0
	Average	172	194	196	1.0%	1.18	1.14	2.8	3.2
	Poor	130	140	143	2.1%	1.11	1.10	3.0	3.5
Southeast	Top	192	178	186	4.5%	0.97	0.97	3.1	2.7
	Average	153	142	139	-2.1%	0.93	0.91	3.2	2.6
	Poor	115	106	102	-3.8%	0.85	0.89	3.2	2.7
Indiana	Top	204	253	261	3.2%	1.27	1.28	3.0	3.0
	Average	173	205	210	2.4%	1.21	1.21	2.9	3.0
	Poor	141	163	168	3.1%	1.17	1.19	3.0	3.1

[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 than is contained in this report. You may also want to obtain advice from a professional that manages agricultural properties.

JULY 2020

PURDUE AGRICULTURAL ECONOMICS REPORT

your source for in-depth agricultural news straight from the experts

Contents:

Indiana farmland values increase but signal concern of potential COVID-19 slump

Todd H. Kuethe, Associate Professor and Schrader Endowed Chair in Farmland Economics

Craig L. Dobbins, Professor of Agricultural Economics

The COVID-19 pandemic will be the defining economic event of 2020. As documented in the previous *Purdue Agricultural Economics Report*, the pandemic has had a profound impact on the Indiana food and agriculture sector. Land is the farm sector's largest input, and as a result, farmland values generally reflect broad trends in the costs and returns of agricultural production. The 2020 *Purdue Land Values and Cash Rents Survey* suggests that farmland prices across the State generally improved on a year-to-year basis. However, the survey suggests that these gains primarily occurred between June and December 2019, and since December, farmland prices have declined modestly. Survey respondents expect these recent declines to continue throughout the remainder of 2020 and expressed concern over the long-run impacts of COVID-19 on Indiana farmland markets.

One survey respondent stated, "Fear of long-term COVID-19 market impacts are real among Southeast Indiana farmers. Despite good economic conditions prior to March 2020, with other factors (trade, policy, etc.), there is little optimism." However, at least one respondent reported "land prices high during this COVID-19 pandemic, at levels not seen for several years, which was not expected." While another stated that "sales in March were higher than we expected them to be, but due to the pandemic, we feel like they have decreased to levels similar to last year."

Statewide, the strongest year-to-year increase was for poor quality land which increased by 6.3% to $5,746 (Table 1). Top quality land increased by 4.5% to $8,579, and average quality land increased by 3.2% to $7,236. The year-to-year increases were driven by positive price movements between June and December 2019. Over this period, top, average,

Cash Rents

Statewide cash rental rates increased across all land quality classes in 2020. The largest increase was in low quality land which increased by 5.4% to $175 per acre. This was followed by a 4.8% and 4.0% increase in average and top quality land, respectively. The rental rate increases offset the reduction in rents that occurred between 2018 and 2019.

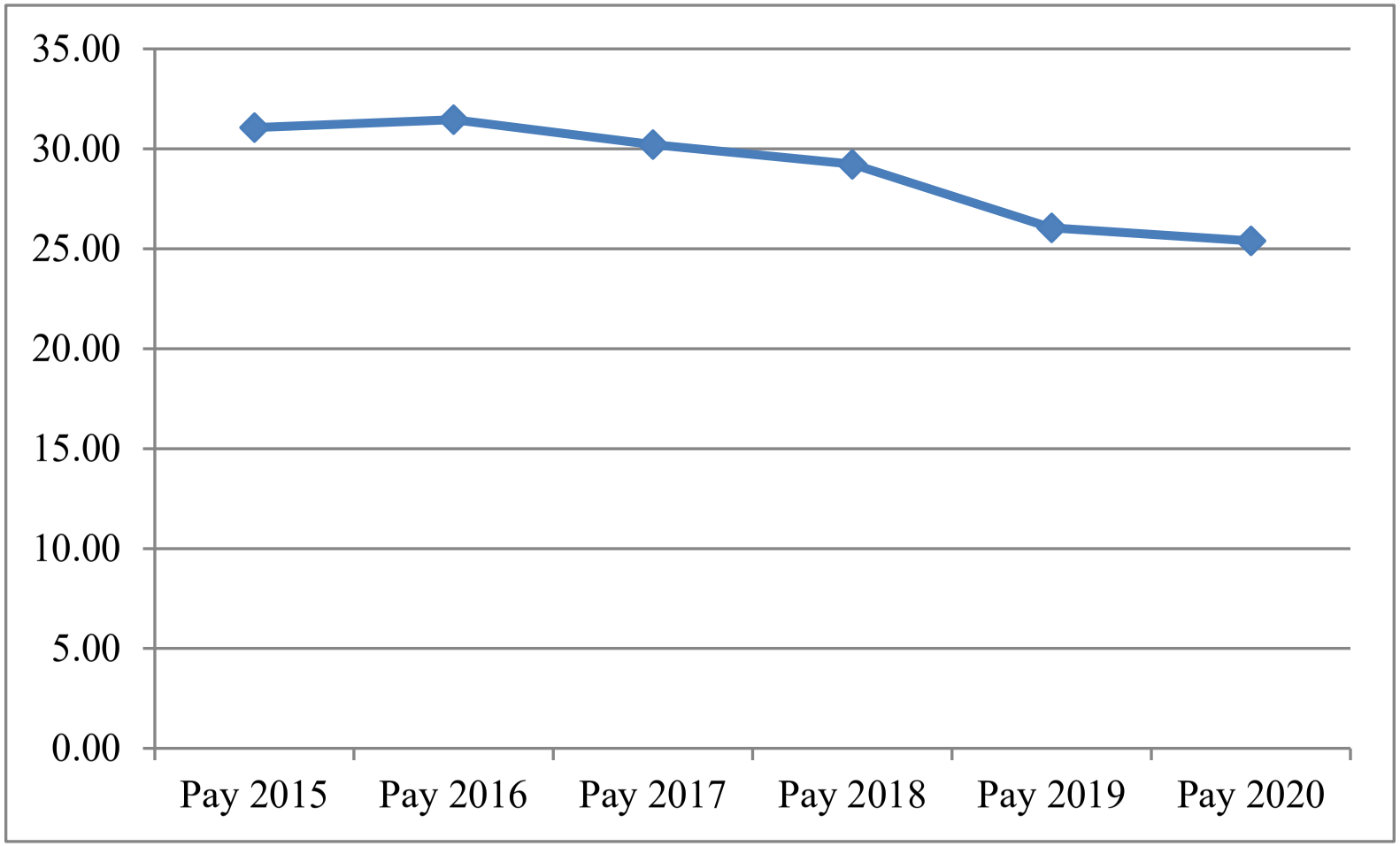
At the regional level, cash rental rates increased across all land qualities and regions, with the exception of low quality land in the North region which fell by 2.9%. Similar to farmland values, the West Central region had the highest cash rental rates for top ($293), average ($252), and poor ($212) quality land. The largest price increases for each quality class were found in the Southwest region. Top quality land increased by 15.5% to $269. Average quality land increased by 19.3% to $216, and poor quality land increased by 20.1% to $161. The West Central region also had the highest cash rental rates in a per bushel of corn basis, ranging from $1.30 to $1.35 per bushel.

Table 4. Average estimated Indiana cash rent per acre, (tillable, bare land) 2019 and 2020, Purdue Land Value Survey, June 2020

			Rent/Acre		Change	Rent/bu. of Corn		Rent as % of June Land Value	
Area	Land Class	Corn bu./A	2019 $/A	2020 $/A	'19-'20 %	2019 $/bu.	2020 $/bu.	2019 %	2020 %
North	Top	208	263	272	3.4%	1.25	1.31	3.3	3.2
	Average	179	214	219	2.3%	1.18	1.22	3.1	3.3
	Poor	150	170	165	-2.9%	1.13	1.10	3.4	3.4
Northeast	Top	201	226	242	7.1%	1.12	1.20	3.0	2.8
	Average	176	189	205	8.5%	1.07	1.16	2.8	2.7
	Poor	152	152	174	14.5%	1.00	1.14	2.9	2.7
W. Central	Top	217	284	293	3.2%	1.31	1.35	3.1	3.1
	Average	189	241	252	4.6%	1.28	1.33	3.1	3.1
	Poor	163	195	212	8.7%	1.20	1.30	3.1	3.2
Central	Top	211	251	261	4.0%	1.21	1.24	2.9	3.0
	Average	184	219	222	1.4%	1.19	1.21	2.9	2.9
	Poor	157	180	185	2.8%	1.15	1.18	2.9	3.0
Southwest	Top	211	233	269	15.5%	1.10	1.27	2.9	2.9
	Average	179	181	216	19.3%	1.01	1.21	2.7	3.0
	Poor	148	134	161	20.1%	0.91	1.09	3.0	3.2
Southeast	Top	188	189	200	5.8%	1.01	1.06	3.2	3.3
	Average	162	151	171	13.2%	0.93	1.06	3.3	3.5
	Poor	132	116	131	12.9%	0.88	0.99	3.5	3.6
Indiana	Top	204	249	259	4.0%	1.22	1.27	3.0	3.0
	Average	175	207	217	4.8%	1.18	1.24	3.0	3.0
	Poor	147	166	175	5.4%	1.13	1.19	3.1	3.0

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, 2021
Average Net Tax Bill/Acre of Farmland

Pay 2015	**31.07**
Pay 2016	**31.46**
Pay 2017	**30.22**
Pay 2018	**29.23**
Pay 2019	**26.05**
Pay 2020	**25.40**

January 1, 2021			Real Estate Loans	Operating Loans	Avg.	Source:
2015	Jan-Mar		4.57	4.80		P-28
	Apr-June		4.64	4.81		P-28
	July-Sept		4.58	4.82		P-28
	Oct-Dec		4.67	4.96		P-28
	Average		4.62	4.85	4.74	
2016	Jan-Mar		4.65	4.91		P-28
	Apr-June		4.57	4.89		P-28
	July-Sept		4.57	4.87		P-28
	Oct-Dec		4.71	5.03		P-28
	Average		4.63	4.93	4.78	
2017	Jan-Mar		4.80	5.13		P-30
	Apr-June		4.86	5.20		P-30
	July-Sept		4.84	5.16		P-30
	Oct-Dec		4.93	5.34		P-30
	Average		4.86	5.21	5.04	
2018	Jan-Mar		5.14	5.53		P-30
	Apr-June		5.28	5.69		P-30
	July-Sept		5.46	5.86		P-30
	Oct-Dec		5.61	6.07		P-30
	Average		5.37	5.79	5.58	
2019	Jan-Mar		5.53	6.04		P-32
	Apr-June		5.39	5.98		P-32
	July-Sept		5.08	5.71		P-32
	Oct-Dec		4.97	5.49		P-32
	Average		5.24	5.81	5.53	
2020	Jan-Mar		4.51	4.83		P-32
	Apr-June		4.40	4.77		P-32
	July-Sept		4.24	4.65		P-32
	Oct-Dec	(1)	4.24	4.65		P-32
	Average		4.35	4.73	4.54	

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

(1) - The information for the 4th quarter of 2020 was not available at the time of this publication so the 3rd quarter of 2020 was used.

The Agricultural Newsletter
from the Federal Reserve Bank of Chicago
Number 1975 *February 2017*

AgLetter

FARMLAND VALUES AND CREDIT CONDITIONS

Summary
Agricultural land values in the Seventh Federal Reserve District suffered a third consecutive annual decrease, yet the 1 percent decrease for 2016 was smaller than the 3 percent declines for the previous two years. "Good" farmland values in the fourth quarter of 2016 were down 1 percent from the third quarter, according to 192 survey respondents from District banks. Nearly 60 percent of the survey respondents expected farmland values to be stable during the January through March period of 2017, while 40 percent expected farmland values to decrease in their local areas.

Farm credit conditions deteriorated further in the fourth quarter of 2016. Lower repayment rates on non-real-estate farm loans in the October through December period of 2016 versus the same period of 2015, combined with higher rates of loan renewals and extensions, suggested a worsening credit climate. Additionally, for 2017, 3 percent of farm loan customers were not expected to qualify for operating credit at the banks of the survey respondents. With non-real-estate loan demand up more than funds available for lending compared to their respective levels of a year ago, the average loan-to-deposit ratio for the District (75.0 percent) was higher than a year ago. Finally, average interest rates on agricultural loans jumped up at the end of 2016 to their highest levels since the end of 2013.

Farmland values

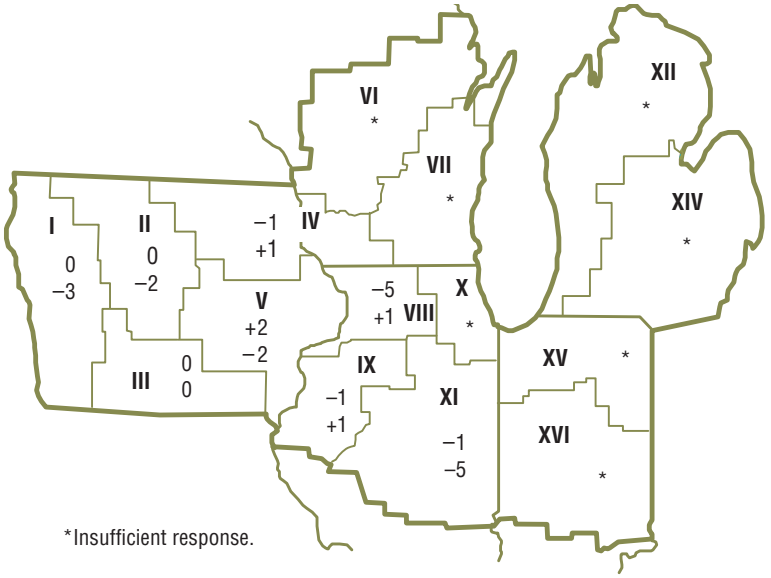
The District experienced an annual decrease of 1 percent in "good" farmland values for 2016, marking the third year in a row of declines. However, this stretch of decreases has been much more moderate than the previous such stretch during the 1980s (see chart 1 on next page). Also, the final quarter of 2016 was the tenth straight quarter without the District as a whole seeing a year-over-year increase in agricultural land values. In the fourth quarter of 2016, Illinois, Iowa, and Michigan saw year-over-year decreases in agricultural land values, while Indiana and Wisconsin saw modest increases (see table and map below). The District's farmland values were down 1 percent in the fourth quarter of 2016 relative to the third quarter.

The District's decrease in farmland values for 2016 was 2 percent after adjusting for inflation. In real terms, the decrease in the District's agricultural land values from their peak in 2013 through the end of 2016 was 9.5 percent (see chart 2 on next page). Since their 2013 peaks, Illinois, Indiana, and Michigan farmland values have experienced real declines of 11 percent, 7 percent, and 12 percent, respectively. Additionally, since their 2012 peak, Iowa farmland values have experienced a real decline of 15 percent. In contrast, Wisconsin agricultural land values have risen 4 percent in real terms since 2013. (Changes in farmland values are based on index values adjusted for inflation.) Even after

Percent change in dollar value of "good" farmland

Top: October 1, 2016 to January 1, 2017
Bottom: January 1, 2016 to January 1, 2017

	October 1, 2016 to January 1, 2017	January 1, 2016 to January 1, 2017
Illinois	−1	−2
Indiana	−2	+2
Iowa	0	−2
Michigan	−1	−8
Wisconsin	−2	+3
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]	Interest rates on farm loans: Feeder cattle[a]	Interest rates on farm loans: Real estate[a]
	(index)[b]	*(index)*[b]	*(index)*[b]	*(percent)*	*(percent)*	*(percent)*	*(percent)*
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
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

[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.

had tighter credit standards for agricultural loans in the fourth quarter of 2016 relative to the fourth quarter of 2015 and 60 percent reported no change. In addition, 24 percent of responding bankers noted that their banks required larger amounts of collateral for customers to qualify for non-real-estate farm loans during the October through December period of 2016 relative to the same period of a year ago, and only 1 percent required smaller amounts. Another notable development was an upward shift in agricultural interest rates. As of January 1, 2017, the average interest rates for farm operating loans (5.03 percent), feeder cattle loans (5.10 percent), and agricultural real estate loans (4.71 percent) were all at their highest levels since the end of 2013.

During the October through December period of 2016 there was more interest among agricultural producers in taking out non-real-estate loans than during the same period of 2015. With 34 percent of survey respondents seeing an increase in the demand for non-real-estate loans and 20 percent seeing a decrease, the index of loan demand stood at 114 in the fourth quarter of 2016. Funds availability during the fourth quarter of 2016 was also above the level of a year ago, as it had been in the final quarter of every year since 2000. The index of funds availability was up a bit at 105, with funds availability higher at 12 percent of the survey respondents' banks and lower at 7 percent. The District's average loan-to-deposit ratio was higher than a year ago, at 75.0 percent—5.8 percentage points below the average level desired by the responding bankers.

Looking forward

Survey respondents indicated 3 percent of their farm customers with operating credit in 2016 were not likely to qualify for new operating credit in 2017 (up a full percentage point from their year-ago projections for 2016). Responding bankers anticipated non-real-estate agricultural loan volumes (primarily operating loans and loans guaranteed by the USDA's Farm Service Agency) to be higher during the first quarter of 2017 relative to the same quarter of a year earlier. Volumes for grain storage loans, farm machinery loans, feeder cattle loans, and farm real estate loans were forecasted to be lower in the January through March period of 2017 relative to the same period of 2016.

At the end of 2016, survey respondents still expected capital spending by farmers to be lower in the year ahead compared with the year just ending. The outlook for capital spending on land or improvements, buildings and facilities, machinery and equipment, and trucks and autos hasn't been positive since the end of 2012. Also, 40 percent of the responding bankers envisaged agricultural land values to decline in the first quarter of 2016, while almost 60 percent envisaged them to be steady. According to a survey respondent, "2016 ended much better than expected," assisted by strong crop yields and some increases in product prices from a year ago. Yet, survey respondents forecasted the downward trends for farmland values and agricultural credit conditions to continue into 2017.

David B. Oppedahl, *senior business economist*

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The Agricultural Newsletter
from the Federal Reserve Bank of Chicago
Number 1983 *February 2019*

AgLetter

FARMLAND VALUES AND CREDIT CONDITIONS

Summary
For 2018, annual farmland values in the Seventh Federal Reserve District were steady overall. Yet, values for "good" agricultural land in the fourth quarter of 2018 were up 1 percent from the third quarter, according to 183 survey respondents representing agricultural banks across the District. Although 75 percent of the responding agricultural bankers expected farmland values to be stable during the January through March period of 2019, nearly all of the rest expected farmland values to move down.

Deteriorating agricultural credit conditions continued to affect the District in the fourth quarter of 2018. Repayment rates on non-real-estate farm loans decreased in the October through December period of 2018 relative to the same period of 2017, and rates of loan renewals and extensions increased. Even so, about the same percentage (2.4 percent) of current agricultural borrowers were not likely to qualify for operating credit at the survey respondents' banks in 2019 as in 2018. Non-real-estate loan demand in the fourth quarter of 2018 climbed from the previous year's level, while funds available for lending were slightly lower than a year ago. The average loan-to-deposit ratio for the District (79.0 percent) was higher than a year earlier. Average interest rates on farm operating loans and farm real estate loans had moved up by the end of 2018 to levels not seen since 2010 and 2011, respectively.

Farmland values

For 2018, the District saw no annual change in "good" farmland values, on balance. That is, the District's agricultural land values in the fourth quarter of 2018 were largely the same as a year ago (see table and map below). For the fourth quarter of 2018, there were no year-over-year changes in agricultural land values in Illinois, Indiana, and Wisconsin; Iowa's farmland values moved down from a year earlier, while Michigan's apparently moved up (too few Michigan bankers responded to report a numerical change in farmland values). The District's farmland values were up 1 percent in the fourth quarter of 2018 relative to the third quarter. Illinois's and Indiana's agricultural land values rose in the fourth quarter of 2018 from the third quarter, but Wisconsin's fell and Iowa's were unchanged.

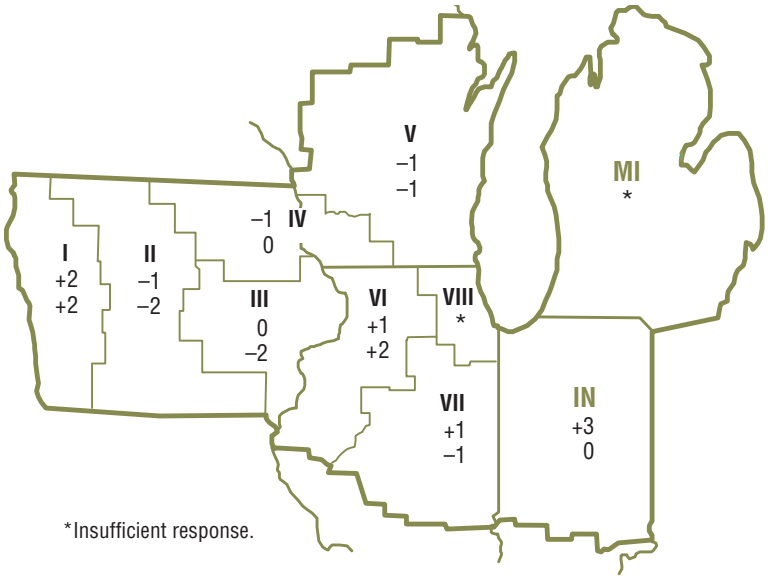
After accounting for inflation, the District actually experienced a yearly decrease of 2 percent in farmland values for 2018 (see chart 1 on next page). This was the fifth straight annual real decline in District farmland values—the longest downturn since the 1980s. The District's farmland values fell 13 percent in real terms from their peak in 2013 to the end of 2018. But the decrease in agricultural land values over this span was just 6 percent in nominal terms (see chart 2 on next page).

Stellar yields for District cropland supported farmland values in 2018. Based on calculations using U.S. Department of Agriculture (USDA) data, the District states' corn yield

Percent change in dollar value of "good" farmland

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

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



*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)*
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
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

[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.

relative to a year ago, as 44 percent of the survey respondents reported their banks tightened credit standards for agricultural loans in the fourth quarter of 2018 relative to the fourth quarter of 2017 and 56 percent reported their banks kept credit standards essentially unchanged. Likewise, 23 percent of responding bankers noted that their banks required larger amounts of collateral for customers to qualify for non-real-estate farm loans during the October through December period of 2018 relative to the same period of a year ago, and none required smaller amounts.

Respondents indicated that demand for borrowing for farm operations shifted higher during the October through December period of 2018 relative to the same period of 2017. With 44 percent of survey respondents reporting an increase in the demand for non-real-estate loans from a year ago and 9 percent reporting a decrease, the index of loan demand was 135 in the fourth quarter of 2018. Yet, funds availability was below the level of a year ago for the sixth consecutive quarter: The index of funds availability stood at 88 in the final quarter of 2018, with funds availability higher than a year ago at 7 percent of the survey respondents' banks and lower at 19 percent. In line with these results, the District's average loan-to-deposit ratio was higher than a year earlier; but at 79.0 percent, this ratio was still 3.2 percentage points below the average level desired by the responding bankers.

Looking forward

Somewhat surprisingly, at the start of 2019, survey respondents indicated that only 2.4 percent (a bit lower than a year ago) of their farm customers with operating credit in the year just past were not likely to qualify for new operating credit in the year ahead. Given record crop yields in Illinois and Indiana, these states had lower percentages of borrowers not likely to get new operating credit in 2019 (only 1.0 percent in Illinois and 2.2 percent in Indiana); however, this proportion was 2.8 percent in Iowa, 2.8 percent in Michigan, and 4.3 percent in Wisconsin. The struggles of dairies probably inflated this percentage for Wisconsin. Responding bankers expected non-real-estate agricultural loan volumes to be higher in the first quarter of 2019 relative to the same quarter of a year earlier, as volumes for operating loans and loans guaranteed by the FSA were forecasted to grow. By contrast, volumes for grain storage, farm machinery, feeder cattle, and dairy loans (as well as farm real estate loans to a lesser extent) were forecasted to be lower in the January through March period of 2019 relative to the same period of 2018. Reflecting this expected reduction in lending, as of the start of 2019, 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 sixth year in a row).

The bulk of responding bankers (75 percent) expected farmland values to be stable in the first quarter of 2019, while 24 percent expected them to decline and only 1 percent expected them to rise. Hence, District agricultural land values are likely to be little changed in the first quarter of 2019.

David B. Oppedahl, *senior business economist*

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The Agricultural Newsletter
from the Federal Reserve Bank of Chicago
Number 1990 *November 2020*

AgLetter

FARMLAND VALUES AND CREDIT CONDITIONS

Summary
Farmland values for the Seventh Federal Reserve District were up 2 percent in the third quarter of 2020 from a year ago, given support from lower interest rates, additional government payments, and some rising agricultural prices. However, values for "good" agricultural land in the District overall were the same in the third quarter of 2020 as in the second quarter, according to the 144 bankers who responded to the October 1 survey. The vast majority of survey respondents (82 percent) anticipated the District's farmland values to be stable during the fourth quarter of 2020. Yet, notably, more of them anticipated an increase in District farmland values in the final quarter of this year than anticipated a decrease.

The District's agricultural credit conditions were mixed during the third quarter of 2020. The availability of funds for lending by agricultural banks was much higher in the third quarter than a year ago, but the demand for non-real-estate farm loans was lower than a year earlier for the first time in seven years. Given these results, the average loan-to-deposit ratio for the District dropped to 75.0 percent in the third quarter of 2020. Repayment rates for non-real-estate farm loans were still down relative to the same quarter of the previous year (and loan renewals and extensions were up), yet the pace of the deterioration slowed. As mentioned earlier, average interest rates on agricultural loans slid further during the third quarter of 2020, which helped boost agricultural land values.

CONFERENCE REMINDER

Midwest Agriculture and Shifting Consumer Preferences

On December 1, 2020, the Federal Reserve Bank of Chicago will hold a virtual event on Midwest agriculture and the changes it may face from shifts in consumer demand. Event details and registration are available online, https://www.chicagofed.org/events/2020/ag-conference.

Farmland values

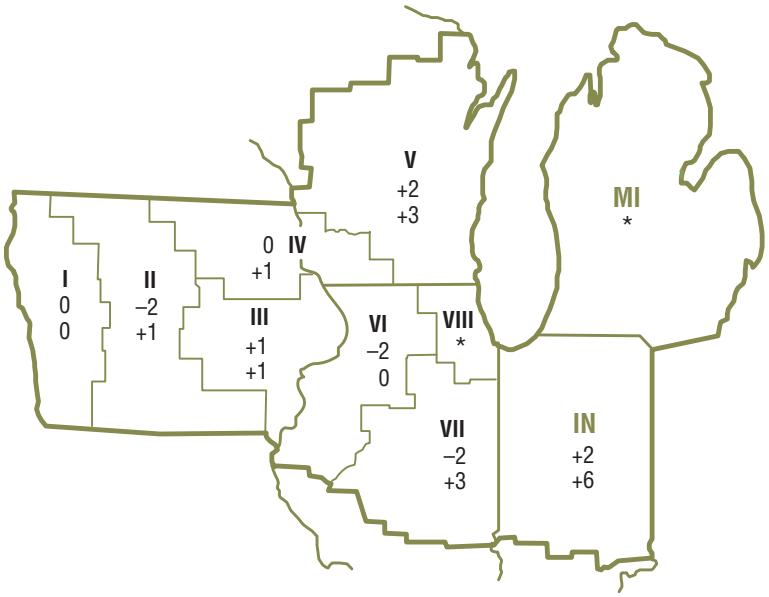
The District observed a year-over-year increase of 2 percent in its agricultural land values in the third quarter of 2020. The District had not seen this large of a year-over-year increase in its farmland values during the past six years. Indiana and Wisconsin led the way with year-over-year jumps in their farmland values of 6 percent and 3 percent, respectively; the growth in farmland values in Illinois (2 percent) and Iowa (1 percent) was more modest (see map and table below). On the whole, the District's agricultural land values were unchanged from the second quarter of 2020, although Illinois's experienced a 2 percent quarterly decrease.

Percent change in dollar value of "good" farmland

Top: July 1, 2020 to October 1, 2020
Bottom: October 1, 2019 to October 1, 2020

	July 1, 2020 to October 1, 2020	October 1, 2019 to October 1, 2020
Illinois	–2	+2
Indiana	+2	+6
Iowa	0	+1
Michigan	*	*
Wisconsin	+1	+3
Seventh District	0	+2

*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)*
2019							
Jan–Mar	141	86	52	78.6	6.04	6.11	5.53
Apr–June	119	93	74	80.2	5.98	6.14	5.39
July–Sept	115	103	70	78.8	5.71	5.77	5.08
Oct–Dec	117	107	79	78.9	5.49	5.61	4.97
2020							
Jan–Mar	117	107	59	78.9	4.83	5.01	4.51
Apr–June	103	119	64	77.6	4.77	4.94	4.40
July–Sept	85	131	93	75.0	4.65	4.79	4.24

[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.

in the third quarter of 2020, as 8 percent of responding bankers observed higher rates of loan repayment than a year ago and 15 percent observed lower rates. In addition, renewals and extensions of non-real-estate agricultural loans were higher in the third quarter of 2020 than in the same quarter of 2019, with 27 percent of the responding bankers reporting more of them and 5 percent reporting fewer. As of October 1, 2020, the District's average interest rates on new operating loans, feeder cattle loans, and farm real estate loans had fallen to their lowest levels on record: 4.65 percent, 4.79 percent, and 4.24 percent, respectively.

Looking forward

Survey respondents who anticipated District farmland values to rise in the final quarter of 2020 outnumbered those who anticipated them to fall. This last happened in the first quarter of 2013. Fifteen percent of survey respondents predicted District farmland values to increase in the fourth quarter of 2020, 4 percent predicted them to decrease, and 82 percent predicted them to be stable (these values do not sum to 100 percent because of rounding). More respondents also expected both farmers and nonfarm investors to have stronger rather than weaker demand to acquire farmland this fall and winter compared with a year earlier. Moreover, respondents anticipated a rise in the volume of farmland transfers.

In contrast with the pattern of the past few years, crop net cash earnings (which include government payments) were expected to be up during the fall and winter from their levels of a year earlier: 44 percent of survey respondents forecasted crop net cash earnings to increase over the next three to six months relative to a year ago, and 28 percent forecasted these earnings to decrease. According to the responding bankers, the District's hog, cattle, and dairy farmers were once more anticipated to endure lower net cash earnings over the fall and winter relative to a year earlier.

By a slim margin, survey respondents forecasted loan repayment rates to decline this fall and winter from a year ago: 22 percent of the responding bankers predicted a lower volume of farm loan repayments over the next three to six months compared with a year earlier, while 18 percent predicted a higher volume. In addition, forced sales or liquidations of farm assets owned by financially distressed farmers were expected to increase in the next three to six months relative to a year ago, according to 31 percent of the responding bankers (8 percent expected a decrease). The District's overall non-real-estate farm loan volume in the October through December period of 2020 was anticipated to be roughly similar to that in the same period of 2019, whereas the District's volume of farm real estate loans was forecasted to be somewhat higher.

Another Wisconsin banker stated that because federal government payments have made up such a large share of net farm income in 2020, "it will be hard for farmers to find a chair when the music stops." Until then, the circling continues while the District's farms prepare for uncertain times ahead.

David B. Oppedahl, *senior business economist*

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

January 1, 2021

	Column	A	B	C	D	E	F	G	H	I	J	K	L	
		2015		2016		2017		2018		2019		2020		Source or Formula:
Line #		Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans	
1	Yield	150	50	173	57.5	180	54	189	57.5	169	51	189	58	IASS - Crop Summary
2	Price - November	3.97	8.84	3.44	9.64	3.32	9.41	3.49	8.60	3.92	8.94	3.73	9.81	IASS - Crop Prices
3	Price - Annual Avg.	3.87	9.70	3.78	9.71	3.63	9.63	3.63	9.44	3.98	8.78	3.71	9.15	DLGF Calculation
4	Price - Market Avg.	3.75	10.20	3.92	9.16	3.63	9.69	3.56	9.61	3.78	8.73	4.10	8.92	IASS - Crop Prices
5	GI - November	595.50	442.00	595.12	554.30	597.60	508.14	659.61	494.50	662.48	455.94	704.97	568.98	Line 1 times Line 2
6	GI -Annual Avg.	580.50	485.00	653.94	558.33	653.40	520.02	686.07	542.80	672.62	447.78	701.19	530.70	Line 1 times Line 3
7	GI - Market Avg.	562.50	510.00	678.16	526.70	653.40	523.26	672.84	552.58	638.82	445.23	774.90	517.36	Line 1 times Line 4
8	AA v Nov	-15.00	43.00	58.82	4.02	55.80	11.88	26.46	48.30	10.14	-8.16	-3.78	-38.28	Line 6 minus Line 5
9	MA v Nov	-33.00	68.00	83.04	-27.60	55.80	15.12	13.23	58.07	-23.66	-10.71	69.93	-51.62	Line 7 minus Line 5
10	NRTL - November	-49		55		7		31		11		110		DLGF Calculation
11	NRTL - Annual Avg	-35		86		41		68		12		89		Line 10 + or - Avg. Line 8
12	NRTL - Market Avg	-32		83		42		67		-6		119		Line 10 + or - Avg. Line 9
13	NRTL Average	-39		75		30		55		6		106		Average Lines 10, 11, & 12
14	FRBC RE Rate	0.0462		0.0463		0.0486		0.0537		0.0524		0.0435		Fed. Res. Bank of Chicago
15	FRBC OP Rate	0.0485		0.0493		0.0521		0.0579		0.0581		0.0473		Fed. Res. Bank of Chicago
16	Avg. FRBC Rate	0.0474		0.0478		0.0504		0.0558		0.0553		0.0454		Average Lines 14 & 15
17	Operating Market Value In Use	-823		1,569		595		986		108		2,335		Line 13 / Line 16

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

Sources: (pages references within this packet)

		2015	2016	2017	2018	2019	2020
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

	Doster/Huie -Table 1	A	B	C	D	E	F	G	H	I	J	K	L	Source of
	Updated - December, 2020	2015		2016		2017		2018		2019		2020		Information
Line #		Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans	Corn	Beans	
1	Yield per Acre	150	50	173	57.5	180	54	189	57.5	169	51	189	58	IN Ag. Stats. Service
2	Price per Bu. - November	3.97	8.84	3.44	9.64	3.32	9.41	3.49	8.60	3.92	8.94	3.73	9.81	IN Ag. Stats. Service
3	Sales	596	442	595	554	598	508	660	495	662	456	705	569	Line 1 X Line 2
4	Less Variable Costs	446	222	399	203	422	232	435	255	447	245	418	235	Purdue Crop Guide
5	Contribution Margin	150	220	196	351	176	276	225	240	215	211	287	334	Line 3 - Line 4
6	Plus Government Pymt.	18		50		30		40		68		40		IN Ag. Stats. Service
7	Total Contribution Margin	194		299		241		252		247		330		Lines 5 + 6 / 2
	Less Overhead:													
8	Annual Machinery	119		122		123		130		130		130		Purdue Crop Guide
9	Drying/Handling													Purdue Crop Guide
10	Family/Hired Labor	93		91		81		66		80		65		Purdue Crop Guide
11	Real Estate Tax	31		31		30		29		26		25		DLGF Study
12	Net ReturnTo Land - Nov.	-49		55		7		27		11		110		Line 7 - 8,9,10, 11

Sources: (pages references within this packet)

		2015	2016	2017	2018	2019	2020	
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:			Indiana Soybean Yields:		
1985	123		1985	41.5	
1986	122		1986	37	
1987	135		1987	40	
1988	83		1988	27.5	
1989	133		1989	36.5	
1990	129		1990	41	
1991	92		1991	39	
1992	147		1992	43	
1993	132		1993	46	
1994	144		1994	47	
1995	113		1995	39.5	
1996	123		1996	38	
1997	122		1997	43.5	
1998	137		1998	42	
1999	132		1999	39	
2000	146		2000	46	
2001	156		2001	49	
2002	121		2002	41.5	
2003	146		2003	38	
2004	168		2004	51.5	
2005	154		2005	49	
2006	157		2006	50	
2007	154		2007	46	
2008	160		2008	45	
2009	171		2009	49	
2010	157		2010	48.5	
2011	146		2011	45.5	
2012	99		2012	44	
2013	177		2013	51.5	
2014	188		2014	55.5	
2015	150	P-36	2015	50	P-38
2016	173	P-36	2016	57.5	P-38
2017	180	P-36	2017	54	P-38
2018	189	P-36	2018	57.5	P-38
2019	169	P-36	2019	51	P-38
2020	189	P-37	2020	58	P-39

Source: Indiana Agricultural Statistics Service

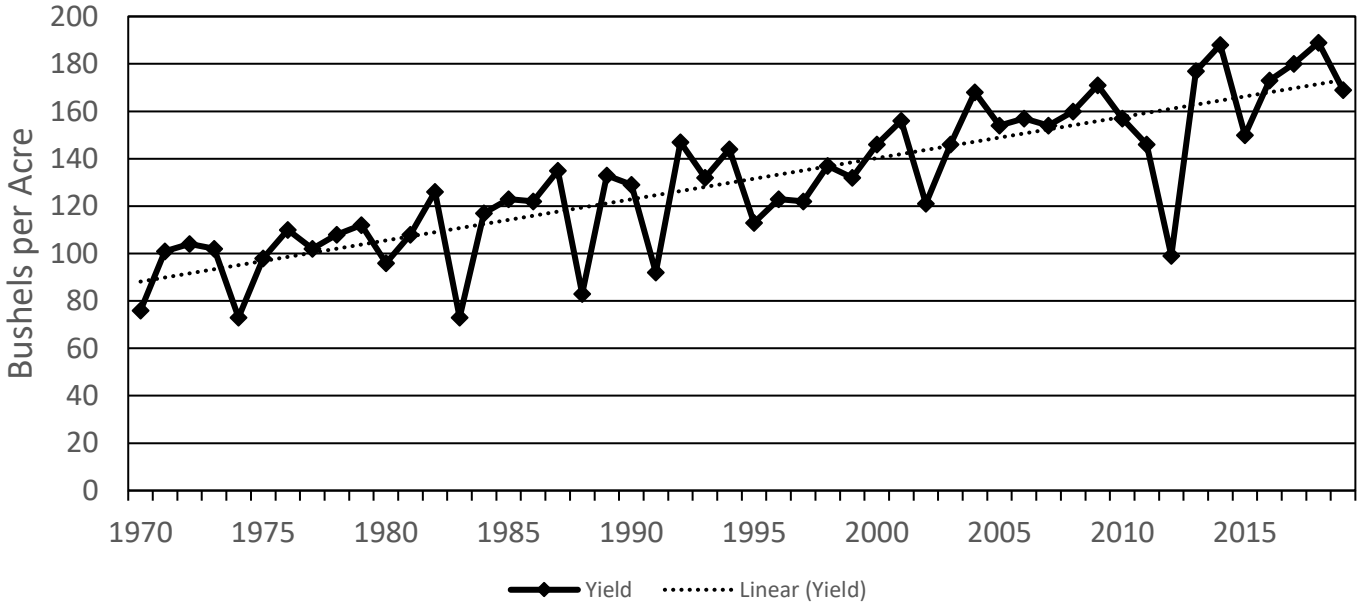
CROP SUMMARY

CORN FORECAST AND FINAL YIELD
INDIANA, 1996-2019

Year	August Forecast	September Forecast	October Forecast	November Forecast	Final Yield Per Acre
	Yield (Bu)	Yield (Bu)	Yield (Bu)	Yield (Bu)	(Bushels)
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
2019	**166**	**161**	**162**	**165**	**169**

[1] Data not available due to sequestration.

Corn Yield Trend
Indiana, 1970-2019



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Quick Stats

Program	Year	Period	Week Ending	Geo Level	State	State ANSI	Ag District	Ag District Code	County	County ANSI	Zip Code	Region	watershed_code	Watershed	Commodity	Data Item	Domain	Domain Category	Value	CV (%)
SURVEY	2020	YEAR		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	189	
SURVEY	2020	YEAR - AUG FORECAST		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	188	
SURVEY	2020	YEAR - NOV FORECAST		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	189	
SURVEY	2020	YEAR - OCT FORECAST		STATE	INDIANA	18							0000D000		CORN	CORN, GRAIN - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	189	
SURVEY	2020	YEAR - SEP FORECAST		STATE	INDIANA	18							0000D000		CORN	CORN, GRAIN - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	186	

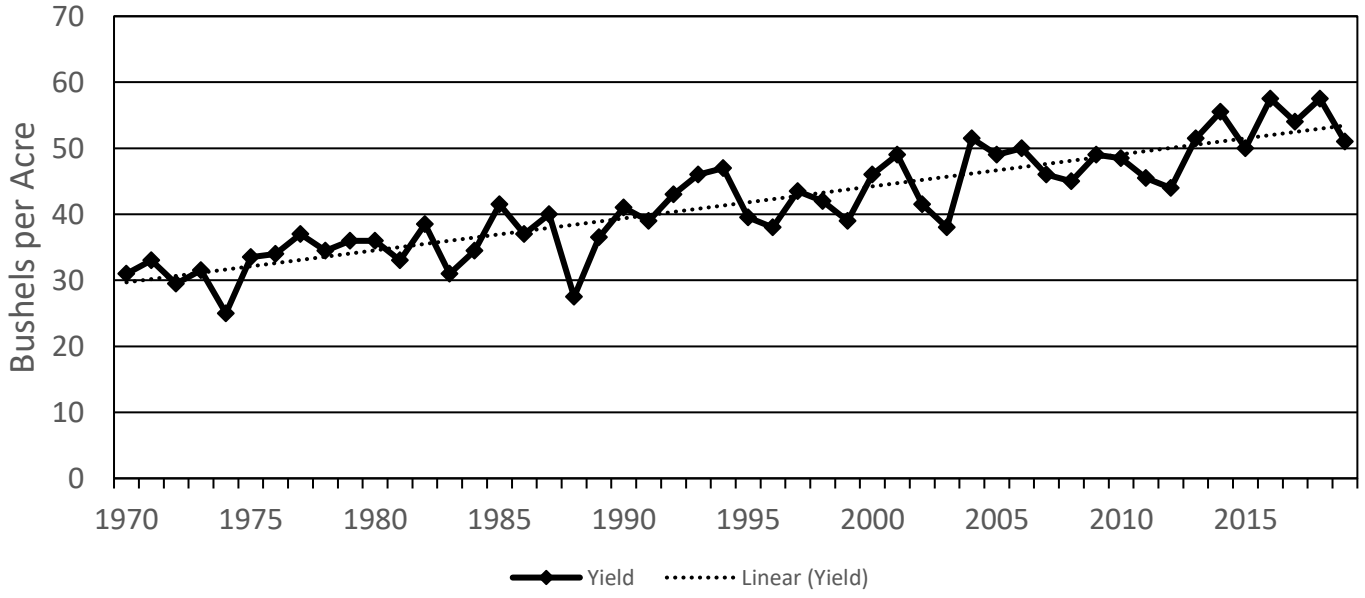
CROP SUMMARY

SOYBEAN FORECAST AND FINAL YIELD
INDIANA, 1996-2019

Year	August Forecast	September Forecast	October Forecast	November Forecast	Final Yield Per Acre
	Yield (Bu)	Yield (Bu)	Yield (Bu)	Yield (Bu)	(Bushels)
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	57.5
2019	**50.0**	**49.0**	**48.0**	**49.0**	**51.0**

[1] Data not available due to sequestration.

Soybean Yield Trend
Indiana, 1970-2019



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Quick Stats

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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	2020	YEAR		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	58	
SURVEY	2020	YEAR - AUG FORECAST		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	61	
SURVEY	2020	YEAR - NOV FORECAST		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	58	
SURVEY	2020	YEAR - OCT FORECAST		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	60	
SURVEY	2020	YEAR - SEP FORECAST		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - YIELD, MEASURED IN BU / ACRE	TOTAL	NOT SPECIFIED	60	

Corn Prices

Source: Indiana Agricultural Statistics

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual Average	Marketing Average *
2000	1.97	2.06	2.08	2.15	2.15	1.95	1.65	1.63	1.67	1.75	1.83	2.06	1.91	1.88
2001	2.03	2.01	2.02	1.98	1.95	1.84	1.97	2.01	1.93	1.83	1.83	1.92	1.94	1.90
2002	1.98	1.99	1.91	1.91	2.05	2.07	2.25	2.58	2.55	2.38	2.41	2.43	2.21	1.98
2003	2.42	2.44	2.44	2.47	2.49	2.44	2.28	2.25	2.27	2.15	2.25	2.46	2.36	2.41
2004	2.50	2.75	2.96	3.07	3.08	2.80	2.57	2.44	2.07	1.88	1.81	1.95	2.49	2.53
2005	2.09	2.01	2.01	1.96	2.02	2.07	2.20	1.97	1.80	1.72	1.71	2.04	1.97	1.99
2006	2.09	2.07	2.15	2.20	2.26	2.21	2.31	2.08	2.32	2.70	3.03	3.23	2.39	2.00
2007	3.16	3.53	3.64	3.54	3.65	3.73	3.36	3.27	3.32	3.34	3.68	4.07	3.52	3.17
2008	4.23	4.67	4.96	5.49	5.82	5.89	5.92	5.67	4.73	4.15	4.04	4.14	4.98	4.39
2009	4.46	4.06	3.92	4.11	4.12	4.14	3.64	3.45	3.31	3.70	3.66	3.62	3.85	4.10
2010	3.79	3.69	3.62	3.51	3.65	3.55	3.69	3.80	4.24	4.50	4.82	4.94	3.98	3.66
2011	4.95	5.78	5.80	6.71	6.62	6.82	7.04	7.18	6.14	5.89	5.94	6.02	6.24	5.38
2012	6.21	6.46	6.59	6.56	6.52	6.55	7.43	7.92	7.37	7.22	7.43	7.27	6.96	6.31
2013	7.26	7.38	7.48	7.12	7.16	7.15	6.71	6.38	5.11	4.34	4.17	4.37	6.22	7.23
2014	4.49	4.48	4.68	4.86	4.91	4.63	4.07	3.88	3.59	3.48	3.54	3.80	4.20	4.47
2015	3.86	3.93	3.94	3.84	3.74	3.67	4.03	3.90	3.85	3.87	3.97	3.88	3.87	3.75
2016	3.97	3.92	3.93	3.97	4.09	4.26	3.89	3.54	3.41	3.40	3.44	3.57	3.78	3.92
2017	3.64	3.73	3.77	3.77	3.79	3.84	3.86	3.64	3.42	3.38	3.32	3.42	3.63	3.63
2018	3.54	3.59	3.72	3.80	3.92	3.81	3.60	3.54	3.45	3.44	3.49	3.70	3.63	3.56
2019	3.76	3.79	3.75	3.68	3.81	4.28	4.55	4.27	3.96	4.01	3.92	4.00	3.98	3.78
2020	4.10	4.04	4.03	3.61	3.43	3.41	3.51	3.48	3.77	3.73	3.73	3.73	3.71	4.10

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

Source: Pages 42 & 43 of this packet

Note: November & December 2020 Prices were not available at the time this calculation was made so the October 2020 price was carried over.

Soybean Prices

Source: Indiana Agricultural Statistics

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual Average	Marketing Average *
2000	4.65	4.90	5.06	5.18	5.27	5.11	4.62	4.63	4.71	4.51	4.57	4.93	4.85	4.71
2001	4.74	4.53	4.52	4.25	4.43	4.62	4.98	5.15	4.60	4.17	4.18	4.25	4.54	4.61
2002	4.29	4.34	4.56	4.63	4.79	5.05	5.51	5.67	5.53	5.24	5.53	5.61	5.06	4.42
2003	5.62	5.69	5.70	5.92	6.28	6.15	5.87	5.84	6.49	6.90	7.25	7.44	6.26	5.55
2004	7.38	8.38	9.43	9.76	9.62	9.45	8.89	7.18	5.51	5.24	5.22	5.47	7.63	7.67
2005	5.57	5.46	6.02	5.99	6.32	6.76	6.93	6.29	5.76	5.60	5.58	6.01	6.02	5.66
2006	6.06	5.83	5.76	5.69	5.83	5.80	5.85	5.53	5.40	5.63	6.13	6.38	5.82	5.78
2007	6.44	6.95	7.17	7.13	7.36	7.83	7.97	8.03	8.49	8.81	9.65	10.30	8.01	6.53
2008	10.10	12.30	11.70	12.30	12.80	14.50	14.50	13.50	11.00	9.78	9.47	9.70	11.80	10.20
2009	10.30	9.88	9.49	10.10	11.10	11.90	11.10	11.00	9.97	9.49	9.63	10.20	10.35	10.20
2010	10.00	9.82	9.70	9.79	9.77	9.79	10.10	10.50	10.10	10.60	11.50	12.20	10.32	9.80
2011	11.70	13.00	12.80	13.30	13.70	13.40	13.70	13.70	12.90	11.80	11.80	11.90	12.81	11.50
2012	12.20	12.50	13.10	14.00	14.10	14.10	15.90	16.40	14.80	14.50	14.60	14.50	14.23	12.70
2013	14.60	14.80	15.00	14.70	15.10	15.60	15.80	14.90	13.40	12.60	12.70	13.10	14.36	14.70
2014	13.20	13.40	13.90	14.60	14.80	14.70	13.70	12.90	11.00	10.00	10.20	10.50	12.74	13.20
2015	10.50	10.20	10.10	9.94	9.91	9.91	10.30	10.00	9.00	8.80	8.84	8.94	9.70	10.20
2016	8.93	8.80	8.90	9.29	10.10	10.90	10.70	10.30	9.62	9.45	9.64	9.91	9.71	9.16
2017	9.96	10.10	9.97	9.51	9.58	9.27	9.77	9.47	9.50	9.42	9.41	9.56	9.63	9.69
2018	9.61	9.79	10.10	10.30	10.50	10.20	8.94	8.85	8.75	8.64	8.60	8.94	9.44	9.61
2019	8.94	8.91	8.83	8.57	8.39	8.71	8.80	8.60	8.60	8.93	8.94	9.17	8.78	8.73
2020	9.22	9.04	9.01	8.64	8.62	8.70	8.87	8.80	9.44	9.81	9.81	9.81	9.15	8.92

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

Source: Page 42 & 44 of this packet

Note: November & December 2020 prices were not available at the time this calculation was made so the October 2020 price was carried over.

CROP PRICES

MONTHLY PRICES RECEIVED BY FARMERS
CROPS, INDIANA, 2013-2020 [1]

Year	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Marketing Year Avg.
Corn (Dollars per Bushel)													
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	3.70	3.76	3.79	3.75	3.68	3.81	4.28	4.55	4.27	3.78
2019-20	**3.96**	**4.01**	**3.92**	**4.01**	**4.08**	**4.04**	**4.03**	**3.61**	**3.43**	**3.41**	**3.51**	**3.48**	**4.10**
Soybeans (Dollars per Bushel)													
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	8.60	8.94	8.94	8.91	8.83	8.57	8.39	8.71	8.80	8.60	8.73
2019-20	**8.60**	**8.93**	**8.94**	**9.17**	**9.22**	**9.04**	**9.01**	**8.64**	**8.62**	**8.70**	**8.87**	**8.80**	**8.92**

Year	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Marketing Year Avg.
Wheat (Dollars per Bushel)													
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
2019-20	**5.08**	**4.91**	**4.62**	**5.00**	**5.28**	**5.27**	**5.26**	**5.48**	**5.32**	**5.43**	**5.47**	**5.44**	**4.95**

[1] Weighted monthly average for market year. 2019 and 2020 are preliminary.
[2] Data not available.

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Quick Stats

Program	Year	Period	Week Ending	Geo Level	State	State ANSI	Ag District	Ag District Code	County	County ANSI	Zip Code	Region	watershed_code	Watershed	Commodity	Data Item	Domain	Domain Category	Value	CV (%)
SURVEY	2020	JAN		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	4.1	
SURVEY	2020	FEB		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	4.04	
SURVEY	2020	MAR		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	4.03	
SURVEY	2020	APR		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	3.61	
SURVEY	2020	MAY		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	3.43	
SURVEY	2020	JUN		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	3.41	
SURVEY	2020	JUL		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	3.51	
SURVEY	2020	AUG		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	3.48	
SURVEY	2020	SEP		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	3.77	
SURVEY	2020	OCT		STATE	INDIANA	18							00000000		CORN	CORN, GRAIN - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	3.73	

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Quick Stats

Program	Year	Period	Week Ending	Geo Level	State	State ANSI	Ag District	Ag District Code	County	County ANSI	Zip Code	Region	watershed_code	Watershed	Commodity	Data Item	Domain	Domain Category	Value	CV (%)
SURVEY	2020	JAN		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	9.22	
SURVEY	2020	FEB		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	9.04	
SURVEY	2020	MAR		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	9.01	
SURVEY	2020	APR		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	8.64	
SURVEY	2020	MAY		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	8.62	
SURVEY	2020	JUN		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	8.7	
SURVEY	2020	JUL		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	8.87	
SURVEY	2020	AUG		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	8.8	
SURVEY	2020	SEP		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	9.44	
SURVEY	2020	OCT		STATE	INDIANA	18							00000000		SOYBEANS	SOYBEANS - PRICE RECEIVED, MEASURED IN $ / BU	TOTAL	NOT SPECIFIED	9.81	

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.

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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.

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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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PURDUE EXTENSION
ID-166-W

2018 Purdue Crop Cost & Return Guide

March 2018 Estimates

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

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

	Crop Budgets for Three Yield Levels[1]														
	Low Productivity Soil					Average Productivity Soil					High Productivity Soil				
	Cont. Corn	**Rot. Corn**	**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]	$3.70	$3.70	$9.90	$4.30	$9.90	$3.70	$3.70	$9.90	$4.30	$9.90	$3.70	$3.70	$9.90	$4.30	$9.90
Market revenue	$481	$511	$426	$262	$297	$599	$636	$525	$327	$366	$718	$762	$624	$391	$436
Less variable costs[4]															
Fertilizer[5]	$124	$112	$39	$55	$29	$132	$121	$47	$73	$34	$140	$129	$55	$90	$40
Seed[6]	91	91	67	44	78	111	111	67	44	78	111	111	67	44	78
Pesticides[7]	61	61	65	25	55	61	61	65	25	55	61	61	65	25	55
Dryer fuel[8]	35	28	N/A	N/A	4	44	35	N/A	N/A	5	52	42	N/A	N/A	5
Machinery fuel @ $2.46	18	18	11	11	8	18	18	11	11	8	18	18	11	11	8
Machinery repairs[9]	22	22	18	18	15	22	22	18	18	15	22	22	18	18	15
Hauling[10]	13	14	4	6	3	16	17	5	8	4	19	21	6	9	4
Interest[11]	11	11	7	5	7	12	12	8	6	7	13	12	8	7	7
Insurance/misc.[12]	36	36	31	9	9	38	38	34	9	9	40	40	34	9	9
Total variable cost	$411	$393	$242	$173	$208	$454	$435	$255	$194	$215	$476	$456	$264	$213	$221
Contribution margin[13] (Revenue - variable costs) per acre	$70	$118	$184	$89	$89	$145	$201	$270	$133	$151	$242	$306	$360	$178	$215

[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 March 28, 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 @ $0.40; P_20_5 @ $0.46; K_20 @ $0.29; lime @ $19.00/ton spread on the field. For very poorly drained soils, consider increasing N rates by 5-10%. For well-drained soils, consider reducing N rates by 5-10%. All soil tests for phosphorus and potassium are assumed to be in the maintenance range, and the pH is in the recommended range.

[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]	$70	$151	$70	$151	$145	$236	$145	$236	$242	$333	$242	$333
Government payment[3]	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total contribution margin	$70	$151	$70	$151	$145	$236	$145	$236	$242	$333	$242	$333
Annual overhead costs:												
Machinery ownership[4]	$138	$130	$91	$86	$138	$130	$91	$86	$138	$130	$91	$86
Family and hired labor[5]	$73	$66	$41	$37	$73	$66	$41	$37	$73	$66	$41	$37
Land[6]	$151	$151	$151	$151	$195	$195	$195	$195	$246	$246	$246	$246
Earnings or (losses)	-$292	-$196	-$213	-$123	-$261	-$155	-$182	-$82	-$215	-$109	-$136	-$36

[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 $65,520 ($85,186 of family living expenses less $46,085 in net nonfarm income plus $26,419 in income and self-employment taxes); a full-time employee with total compensation of $42,084; and a part-time employee with compensation of $3,630. Family living withdrawal information is based on Illinois FBFM summary information. Employee compensation is based on Employee Wage Rates and Compensation Packages on Kansas Farms, Kansas State University, August 2012. For the smaller acreages, labor expense includes the same family living withdrawal and no hired labor. Labor costs are likely to vary widely from farm to farm.

[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.

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2019 Purdue Crop Cost & Return Guide

March 2019 Estimates

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

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

	Crop Budgets for Three Yield Levels[1]														
	Low Productivity Soil					Average Productivity Soil					High Productivity Soil				
	Cont. Corn	**Rot. Corn**	**Rot. Beans**	**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]	$3.70	$3.70	$8.90	$4.40	$8.90	$3.70	$3.70	$8.90	$4.40	$8.90	$3.70	$3.70	$8.90	$4.40	$8.90
Market revenue	$485	$514	$383	$268	$267	$607	$644	$481	$339	$338	$725	$773	$579	$405	$409
Less variable costs[4]															
Fertilizer[5]	$143	$128	$43	$60	$32	$152	$138	$53	$80	$39	$160	$147	$62	$98	$46
Seed[6]	91	91	67	44	78	111	111	67	44	78	111	111	67	44	78
Pesticides[7]	58	58	50	30	45	58	58	50	30	45	58	58	50	30	45
Dryer fuel[8]	32	26	N/A	N/A	4	40	32	N/A	N/A	5	48	39	N/A	N/A	6
Machinery fuel @ $2.52	19	19	11	11	8	19	19	11	11	8	19	19	11	11	8
Machinery repairs[9]	22	22	18	18	15	22	22	18	18	15	22	22	18	18	15
Hauling[10]	13	14	4	6	3	16	17	5	8	4	20	21	7	9	5
Interest[11]	12	11	7	6	6	13	12	7	6	7	13	13	8	7	7
Insurance/misc.[12]	36	36	31	9	9	38	38	34	9	9	40	40	34	9	9
Total variable cost	$426	$405	$231	$184	$200	$469	$447	$245	$206	$210	$491	$470	$257	$226	$219
Contribution margin[13] (Revenue - variable costs) per acre	$59	$109	$152	$84	$67	$138	$197	$236	$133	$128	$234	$303	$322	$179	$190

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

Table 1 (Continued)

[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 @ $0.38; urea @ $0.43; P_20_5 @ $0.49; K_20 @ $0.33; lime @ $19.00/ton spread on the field. For very poorly drained soils, consider increasing N rates by 5-10%. For well-drained soils, consider reducing N rates by 5-10%. All soil tests for phosphorus and potassium are assumed to be in the maintenance range, and the pH is in the recommended range.

[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]	$59	$131	$59	$131	$138	$217	$138	$217	$234	$313	$234	$313
Government payment[3]	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total contribution margin	$59	$131	$59	$131	$138	$217	$138	$217	$234	$313	$234	$313
Annual overhead costs:												
Machinery ownership[4]	$138	$130	$85	$80	$138	$130	$85	$80	$138	$130	$85	$80
Family and hired labor[5]	$89	$80	$48	$43	$89	$80	$48	$43	$89	$80	$48	$43
Land[6]	$164	$164	$164	$164	$208	$208	$208	$208	$264	$264	$264	$264
Earnings or (losses)	-$333	-$243	-$238	-$156	-$297	-$201	-$203	-$114	-$257	-$161	-$163	-$74

[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 or PLC payments in 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.

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2020 Purdue Crop Cost & Return Guide

March 2020 Estimates

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

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

	Crop Budgets for Three Yield Levels[1]														
	Low Productivity Soil					Average Productivity Soil					High Productivity Soil				
	Cont. Corn	**Rot. Corn**	**Rot. Beans**	**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]	133	141	44	62	31	165	176	54	77	38	198	211	65	93	46
Harvest price[3]	$3.40	$3.40	$8.35	$5.20	$8.35	$3.40	$3.40	$8.35	$5.20	$8.35	$3.40	$3.40	$8.35	$5.20	$8.35
Market revenue	$452	$479	$367	$322	$259	$561	$598	$451	$400	$317	$673	$717	$543	$484	$384
Less variable costs[4]															
Fertilizer[5]	$119	$107	$38	$53	$28	$126	$115	$45	$70	$34	$133	$123	$53	$87	$39
Seed[6]	91	91	67	44	78	111	111	67	44	78	111	111	67	44	78
Pesticides[7]	58	58	50	30	45	58	58	50	30	45	58	58	50	30	45
Dryer fuel[8]	29	23	N/A	N/A	4	36	29	N/A	N/A	5	43	34	N/A	N/A	6
Machinery fuel @ $2.07	15	15	9	9	7	15	15	9	9	7	15	15	9	9	7
Machinery repairs[9]	22	22	18	18	15	22	22	18	18	15	22	22	18	18	15
Hauling[10]	13	14	4	6	3	17	18	5	8	4	20	21	7	9	5
Interest[11]	11	11	7	5	6	12	12	7	6	6	12	12	7	7	7
Insurance/misc.[12]	36	36	31	9	9	38	38	34	9	9	40	40	34	9	9
Total variable cost	$394	$377	$224	$174	$195	$435	$418	$235	$194	$203	$454	$436	$245	$213	$211
Contribution margin[13] (Revenue - variable costs) per acre	$58	$102	$143	$148	$64	$126	$180	$216	$206	$114	$219	$281	$298	$271	$173

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

Table 1 (Continued)

[4]Input prices for variable costs reflect expected prices for 2020. These prices will vary by location and time of the year. Users need to adjust these prices to reflect their own expectations and price situation.

[5]Phosphate, potash, and lime applications are based on Tri-State Fertilizer Recommendations (Source: Purdue Extension Bulletin, AY-9-32, July 1995). Lime amounts represent the pounds of standard ag lime needed to neutralize the acidity from the nitrogen supplied from sources other than ammonium sulfate. Nitrogen application rate for corn is based on research from the Department of Agronomy, Purdue University. Anhydrous ammonia is used as the nitrogen source for corn. Urea is used as the nitrogen source for wheat. Pounds of N, 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 @ $0.31; urea @ $0.39; P_20_5 @ $0.38; K_20 @ $0.30; lime @ $19.00/ton spread on the field. For very poorly drained soils, consider increasing N rates by 5-10%. For well-drained soils, consider reducing N rates by 5-10%. All soil tests for phosphorus and potassium are assumed to be in the maintenance range, and the pH is in the recommended range.

[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 ownership, 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]	$58	$123	$58	$123	$126	$198	$126	$198	$219	$290	$219	$290
Government payment[3]	$23	$23	$23	$23	$23	$23	$23	$23	$23	$23	$23	$23
Total contribution margin	$81	$146	$81	$146	$149	$221	$149	$221	$242	$313	$242	$313
Annual overhead costs:												
Machinery ownership[4]	$138	$130	$85	$80	$138	$130	$85	$80	$138	$130	$85	$80
Family and hired labor[5]	$72	$65	$43	$39	$72	$65	$43	$39	$72	$65	$43	$39
Land[6]	$159	$159	$159	$159	$208	$208	$208	$208	$257	$257	$257	$257
Earnings or (losses)	-$288	-$208	-$206	-$132	-$269	-$182	-$187	-$106	-$225	-$139	-$143	-$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 current farm bill will provide PLC payments for corn base acres in 2020.

[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 2019 cash rent per bushel of corn yield reported in the article entitled "2019 Indiana Farmland Values and Cash Rents Slide Lower," Purdue Agricultural Economics Report, August, 2019. The relatively tight margins expected in 2020 will likely dampen increases in cash rents, thus 2020 cash rents are assumed to be the same as 2019 cash rents.

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

Date: 3/24/20

Calculation of Average Government Payments per Acre January 1, 2021

Line #		2015	2016	2017	2018	2019
1	Total Government Payment	220,742,000	624,674,000	373,228,000	516,224,000	878,992,000
2	Less Milk Income Loss Payment	-1,000	0	0	0	0
3	Less Dairy Margin Protection	-9,000	-202,000	0	-3,638,000	-3,787,000
4	Net Government Payment	220,732,000	624,472,000	373,228,000	512,586,000	875,205,000
5	Cropland Acres	12,590,633	12,590,633	12,590,633	12,909,673	12,909,673
6	Pymt Per Acre	17.53	49.60	29.64	39.71	67.79

Source: USDA-Indiana Ag Statistics Service

		2015	2016	2017	2018	2019
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 2020 is not currently available. The Department has estimated the Government Payment per Acre for 2020 in the following way.

Average Total Government Payment (2015-2019)	522,772,000
Average Milk Income Loss Payment (2015-2019)	-200
Average Dairy Margin Protection Pymt (2015-2019)	-1,527,200
Estimated Net Government Payment for 2020	521,244,600
Cropland Acres (P-66)	12,909,673
Estimated Payment Per Acre for 2020	40.38

INDIANA

AGRICULTURAL STATISTICS 2019-2020

FARM INCOME

FARM PRODUCTION EXPENSES, BY CATEGORY, INDIANA, 2015-2019 [1]

Item	2015	2016	2017	2018	**2019**
			Thousand Dollars		
Total Production Expenses	10,546,086	10,715,731	10,249,505	10,054,013	**10,123,647**
Intermediate Product Expenses					
Farm-origin Expenses	2,742,299	2,665,357	2,510,786	2,462,764	**2,733,692**
Feed Purchases	1,410,000	1,450,000	1,150,000	1,130,000	**1,380,000**
Livestock and Poultry	382,299	255,357	370,786	392,764	**393,692**
Seed Purchases	950,000	960,000	990,000	940,000	**960,000**
Manufactured Inputs	2,153,720	2,062,254	2,009,080	2,150,280	**1,994,537**
Pesticide Expenditures	500,000	560,000	560,000	560,000	**560,000**
Fertilizer, Lime, and Soil Conditioner	1,200,000	1,060,000	960,000	1,080,000	**950,000**
Fuels and Oils	353,712	315,587	377,194	394,785	**381,843**
Electricity	100,008	126,667	111,886	115,495	**102,694**
Labor Expenses					
Cash Expenses	398,011	441,254	479,917	502,668	**431,996**
Contract Labor	23,181	36,237	26,356	16,363	**11,094**
Hired Labor and Employee Compensation	374,830	405,017	453,561	486,304	**420,902**
Non-cash Employee Compensation	11,989	8,746	20,083	17,332	**3,004**
Interest Expenses	502,099	532,285	615,953	684,172	**686,058**
Net Rent, Including Landlord Capital Consumption	1,080,633	1,249,669	1,114,355	982,788	**1,125,109**
Property Taxes and Fees	506,088	435,711	462,678	536,821	**506,316**
Personal Property Taxes	39,505	32,386	48,450	33,351	**34,510**
Motor Vehicle Registration and Licensing Fees	26,088	25,711	27,678	26,821	**26,316**
Real Estate	440,495	377,614	386,550	476,649	**445,490**
Capital Consumption	1,413,716	1,535,728	1,245,833	1,011,363	**993,226**

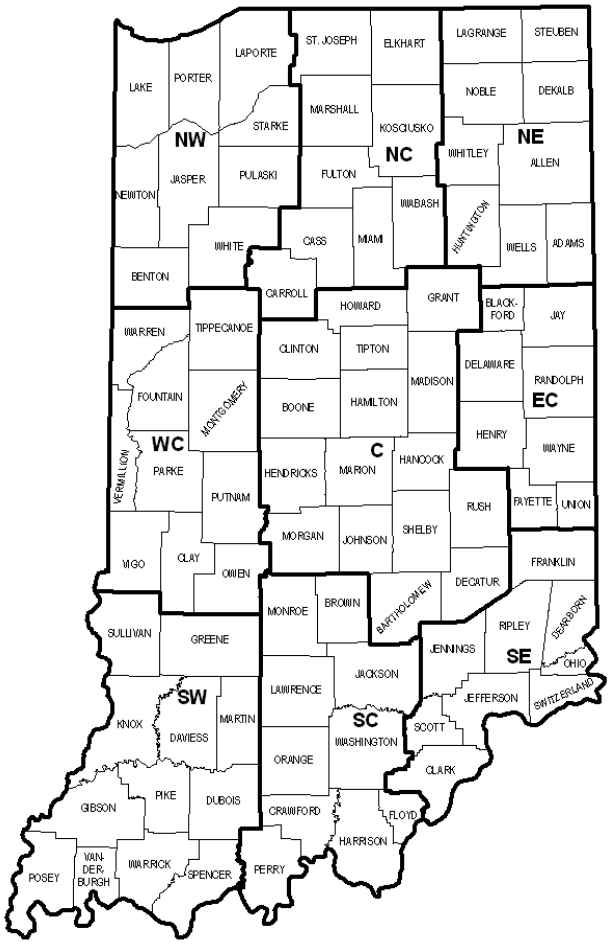
Data as of September 2, 2020
[1] All data includes Operator Dwellings
Source: Economic Research Service

U.S. GOVERNMENT DIRECT FARM PROGRAM PAYMENTS BY PROGRAM, INDIANA, 2015-2019 [1 2 3]

Program	2015	2016	2017	2018	**2019**
			Thousand Dollars		
Fixed Direct Payments	(239)	42	0	(13)	**(19)**
Cotton Ginning Cost-Share (CGCS) Program	NA	9	0	8	**0**
Average Crop Revenue Election Program (ACRE)	(3)	6	0	0	**0**
Price Loss Coverage (PLC)	0	2,498	8,700	7,764	**2,453**
Agricultural Risk Coverage (ARC)	148,676	539,282	285,888	50,301	**4,453**
Loan Deficiency Payments	0	0	0	0	**(1)**
Milk Income Loss Payments	1	0	0	0	**0**
Dairy Margin Protection Program	9	202	0	3,638	**3,787**
Tobacco Transition Payments	11	0	0	0	**0**
Conservation	69,826	73,219	77,745	87,747	**78,290**
Supplemental and ad hoc disaster assistance	2,461	9,416	790	847	**37,201**
Miscellaneous Programs [4]	0	0	105	365,931	**752,827**
Total	220,742	624,674	373,228	516,224	**878,992**

Data as of September 2, 2020
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 2019 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

2019 Census Population	6,732,219
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

2018 Cash Receipts	$11,002,815,000
Crop Receipts	$6,920,148,000
Livestock Receipts	$4,082,667,000
2018 Other Income	$1,088,641,000
Government Payments	$516,224,000
Imputed Income/Rent Received	$572,417,000
2018 Total Income	$12,091,456,000
Less: Production Expenses	$10,839,256,000
Realized Net Income	$1,252,200,000

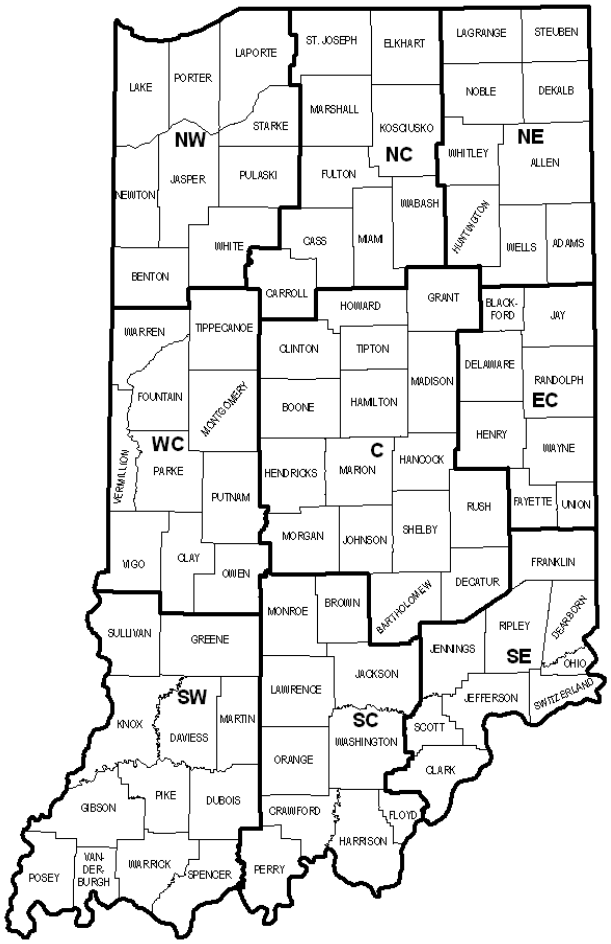
2019 CROPS	PLTD	HARV	YLD	UNIT	PROD
Corn	5,000,000	4,820,000	169.0	Bu	814,580,000
Soybeans	5,400,000	5,360,000	51.0	Bu	273,360,000
Wheat	330,000	260,000	62.0	Bu	16,120,000
Alfalfa Hay	---	220,000	3.00	Ton	660,000
Other Hay	---	300,000	2.10	Ton	630,000
2017 Popcorn	---	79,222	---	Lbs	352,386,717

LIVESTOCK	NUMBER HEAD
Jan 2020 All Cattle	840,000
Beef Cows	194,000
Milk Cows	176,000
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	Care for 2018 crops	Harvest 2018 crops	Prep equipment for storage	Planting 2019 crops	Care for 2019 crops
Sell a portion of the 2017 crops	Sell remainder of the 2017 crops	Sell a portion of the 2018 crops	Sell a portion of the 2018 crops	Sell a portion of the 2018 crops	Sell remainder of the 2018 crops
Paying 1/1/17 Property Taxes		Paying 1/1/17 Property Taxes		Paying 1/1/18 Property Taxes	
Collect all or a portion of 2018 Cash Rent		Collect remainder of 2018 Cash Rent, if any due		Collect all or a portion of 2019 Cash Rent	

CASH RENT INCOME - CALENDAR YEAR

OPER. INCOME - 1/3 NOVEMBER GRAIN PRICES

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

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