

PURDUE AGRICULTURAL ECONOMICS REPORT

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NEWS STRAIGHT FROM THE EXPERTS

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RENTS FOR INDIANA PASTURE LAND, IRRIGATED LAND, HAY GROUND, AND ON-FARM GRAIN STORAGE IN 2017

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Estimates for the current rental value of pasture land, irrigated land, hay ground, and on-farm grain storage in Indiana are often difficult to locate. For the past several years, questions about these items have been included in the Purdue Farmland Value Survey. The values from the June 2017 survey are reported here. Because the number of responses for some items is small, the number of responses is reported.

Averages for pasture rent, irrigated land, hay ground, and the rental of on-farm grain storage are presented in Tables 1, 2, 3, and 4,

Region	Number of responses	Annual rent (\$ per acre)	Carrying Capacity (acres per cow)
North	11	\$106	1.7
Northeast	8	\$100	1.7
West Central	9	\$117	1.8
Central	16	\$92	1.8
Southwest	5	\$53	1.9
Southeast	9	\$55	1.7
State	58	\$90	1.8

respectively. The rental rate for grain bins includes the situation where there is just a bin and the situation where there is a bin and utilities.

Similar rental rates for 2015 and earlier years is in the August issue of the [Purdue Agricultural Economics Report archive](#). The first year for reporting this information was 2006. For 2016, these rental rates are in the February 2017 issue.

Region ¹	Number of responses	Corn Yield (bu. per acre)	Market Value (\$ per acre)	Cash Rent (\$ per acre)	Rent as % of Land Value
North & Northeast	19	232	\$8,905	\$302	3.4%
West Central & Central	12	240	\$7,625	\$303	4.0%
State	36	234	\$8,375	\$301	3.6%

¹ There was an insufficient number of responses for the other regions to report values. The values from these regions are included in the state total.

Region ¹	Alfalfa/Alfalfa-Grass Hay		Grass Hay	
	Responses	Rent (\$/A)	Responses	Rent (\$/A)
North	10	\$147	10	\$101
Northeast	8	\$147	6	\$75
Central	12	\$185	12	\$137
Southwest & Southeast	11	\$92	10	\$67
State	48	\$152	45	\$152

¹ There was an insufficient number of responses for the other regions to report values. The values from these regions are included in the state total.

Region	Bins only		Bins and electric utilities	
	Number of responses	Rent (\$/bu.)	Number of responses	Rent (\$/bu.)
North & Northeast	21	\$0.17	18	\$0.20
West Central & Central	28	\$0.18	26	\$0.25
Southwest & Southeast	16	\$0.14	16	\$0.20
State	65	\$0.17	60	\$0.22

RETIREMENT IN THE FAMILY BUSINESS: FARM AND NON-FARM DIFFERENCES

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Retirement planning is always challenging but can be especially complicated if you own your business, work for a family business, or are self-employed. Copreneurs (those who own a business with their

spouse) have especially complicated situations since the financial wellbeing of both individuals is linked to the business.

Family businesses have many retirement considerations including:

- Who will take over the management of the business
- Whether or not ownership will be relinquished upon retirement
- Trust in a successor
- Whether a retirement plan has already been funded or retirement funds have to be withdrawn from the ongoing family business
- Selling the business in order to fund retirement
- Whether retirement will take place in phases or all at once
- Will retirement be partial or full

Sherwood (2007) urges business owners to consider partial retirement, with the owner retaining management decisions and delegating other tasks to the next generation. This would allow the owner to maintain control, while freeing up time to travel and enjoy hobbies. Kim and DeVaney (2003) found that partial retirement is in the forefront of family business owners' minds, with 40% of their sample confirming that they expect to partially retire (instead of fully retiring). While partial retirement may not be ideal for all, it could be a great compromise for some family business owners.

Retirement decisions in the family business can be more emotionally trying than retirement decisions for wage-based employees. The integration of the family and the business into one's everyday life makes exit emotional for many owners. Otherwise straightforward business decision can become more difficult for a family business.

I plan to transfer the family business to a family successor even if it puts my own personal wealth and livelihood at increased risk.	Annual Mean Business Profit
Disagree	\$56,730
Unsure	\$85,606
Agree	\$93,469

The Family Business Succession Survey (2012) found that 55% of owners had thought about succession planning because of their desire to retire. Further, 37% of owners responded favorably to, "I plan to transfer the family business to a family successor even if it puts my own personal wealth and liveli-

hood at increased risk". We measured annual mean business profit related to each response and found that when owners responded "disagree" to the aforementioned question, they had roughly \$36,000 lower mean annual business profit than owners who responded "agree". Mean annual business profit for owners who disagreed was roughly \$57,000, it was \$86,000 for those who were unsure, and it was \$93,000 for those owners who agreed, Table 1.

When the family business is a farm business, the retirement decisions can become even more complicated. The farming industry is notorious for owners who "never really retire" or whose retirement plan is to "die on the tractor." According to the 2012 U.S. Census Data (2014), 33% percent of farmers are 65 years of age or older. Within 30 years, the average age of the American farmer has increased by roughly 8 years, moving from 50.5 years of age in 1982 to 58.3 years in 2012.

I plan to transfer the family business to a family successor even if it puts my own personal wealth and livelihood at increased risk.	Farm Businesses	Non-Farm Businesses
Disagree	49%	59%
Unsure	11%	10%
Agree	40%	31%
	Farm Businesses	Non-Farm Businesses
Mean Age	56.4 years	55.6 years

Table 2 shows the differences between farm and non-farm decisions to transfer the family business. The Family Business Succession Survey showed that the average age of farm business owners was 56.4 years and the average age of non-farm business owners was 55.6 years, only a slight difference. A larger difference between farm and non-farm businesses was in willingness to put themselves in financial risk. While only 31% of non-farm businesses planned to transfer the family business even if it put the owner's wealth and livelihood at increased risk, 40% of farm business owners would agree to the increased risk.

Careful consideration of the owner's involvement before, during, and after retirement is necessary for a smooth retirement process. Added benefits of careful succession planning include: minimizing emotional pain, minimizing the tax burden, maximizing the wellbeing of retiring owner(s), and adhering to the owner's wishes when the business transfers from one

generation to the next (Battersby, 2012). Clearly, the transition to retirement is not easy, especially in a family business, but retirement is possible with sound planning in place.

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CHINESE TARIFFS ON SOYBEANS AND PORK: U.S. AND INDIANA IMPACTS

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The prospect of a trade war has been prominent in the news this year. The 2018 threats began with the U.S. putting tariffs on solar panels and washing machines and soon moved to steel and aluminum. China retaliated with \$3 billion of tariffs on U.S. exports to China including \$1.1 billion of U.S. pork. A further \$50 billion threat by the U.S. administration resulted in a similar sized threat by China that included \$16.5 billion of U.S. agricultural exports to China including soybeans where U.S. sales to China were \$12.4 billion in 2017.

While a number of U.S. agricultural exports to China have been named, the largest impacts will be on soybeans. In this article, we also discuss impacts on pork for both the U.S. and Indiana.

We have received many important questions from the media, agricultural organizations and policymakers on the proposed Chinese tariffs. Here we provide some background information and estimates of effects if the threatened tariffs on soybeans and pork should proceed.

Q. How important is China in the global soybean market?

- China is the largest user of soybeans in the world. The U.S. is the second largest user and has about one-half the domestic use of China.
- China only raised 13% of the soybeans they will consume in the current marketing year. This means they will import 87% of the total beans

they consume.

- China currently buys about 65% of all the soybeans that move in global trade.
- The U.S. will supply 29% of all the soybeans that China will use this marketing year.
- In calendar year 2017, the U.S. sold China 1.2 Billion bushels of soybeans valued at \$12.4 Billion. This was around 30% of U.S. production.

Q. How would a 25% Chinese tariff on U.S. soybeans work?

- If China puts an additional 25% tariff on U.S. origin soybeans this is essentially a tax to allow U.S. origin beans to enter China.
- An additional 25% Chinese tariff would largely make U.S. origin soybeans uncompetitively priced compared to other countries such as Brazil and Argentina.
- The Chinese tariff on U.S. origin beans means that soybean processors in China would buy beans first from our competitors because they were lower-priced.
- China would still need to buy some U.S. soybeans because we are such a large supplier. But, the U.S. would become the supplier of last resort, often called the “residual supplier.” China would first buy from our competitors and purchase the minimum they can from the U.S.
- China would pay a higher price for both competitor beans and U.S. beans.

Q. What would be some impacts of a 25% Chinese

soybean tariff?

- Purdue Ag Economists Tyner and Taheripour have completed a study of the impacts of a 25% Chinese tariff on soybeans. Given the many assumptions in their models, they find that after approximately 5 years of adjustment the tariff would result in:
 - ◊ U.S. soybean exports to China dropping 65%
 - ◊ U.S. global soybean exports dropping 37%
 - ◊ U.S. soybean production dropping by 15% (mostly from lower soybean acres)
 - ◊ Soybean prices dropping about 5%
 - ◊ U.S. and Chinese economic wellbeing falling \$3 billion per year.

Q. How would the Indiana soybean industry be affected?

- Indiana farmers planted almost 6 million acres of beans in 2017. Soybeans were the largest acreage crop with corn second at 5.35 million acres.
- Indiana produced 321 million bushel of soybeans with an estimated farm value of \$3.1 billion in 2017.
- Indiana ranked as the 5th largest soybean state by acres planted.
- The Chinese soybean tariff is estimated to drop revenues for Indiana soybeans by around \$150 million annually assuming a 5% price reduction.
- The \$150 million drop in revenue represents about a 10% decline in the \$1.5 billion of annual Indiana farm income from the most recent official data for 2016.
- Overtime, lower soybean prices would lead to reduced soybean acres and more acres of corn, wheat and other crops. Prices and revenues for those crops would drop somewhat as well.

Q. Is China a big buyer of U.S. pork?

- China proposed a 25% tariff on U.S. pork exports on April 2, 2018.
- China is the world's largest producer and consumer of pork. Their consumption is nearly 3 times the European Union (second largest) and almost 6 times the U.S. (third largest).
- China raises 97% of their own pork. Imports from the U.S. represent only 1% of their consumption.
- Unlike soybeans, China can easily replace the shortfall of U.S. pork from our pork competitors like the EU and Canada.
- Chinese tariffs on U.S. pork exports will have minor impacts on China.

Q. How might the Chinese pork tariff affect the U.S. and Indiana pork industries?

- U.S. pork exports to China represented 2% of

U.S. production in 2017.

- Chinese tariffs will make U.S. pork largely uncompetitive in China and U.S. exports to China would drop to near zero.
- The loss of a market that represents 2% of our production will lower hog and pork prices in the U.S.
- There will be at least two positive compensations from these lower prices:
 - ◊ U.S. consumers will buy somewhat more pork at the lower prices.
 - ◊ The EU and Canada will ship more pork to China and less to some other destinations. The U.S. will pick-up some of this business.
- Purdue Ag Economist Chris Hurt has made some rough estimates of these impacts:
 - ◊ U.S. Hog prices drop about \$3 per head
 - ◊ Nationally, this reduces revenues about \$350 million annually
 - ◊ Indiana produces near 9 million head of hogs a year. So this is a revenue reduction of around \$25 million.
 - ◊ The Indiana industry had farm receipts near \$1.3 billion in 2017. So, the tariff impact would lower revenue about 2%.
 - ◊ The tariff would result in a small downsizing of the U.S. industry and provide an incentive to slightly expand production in competitive countries such as the EU and Canada.

Q: Can the current trade disputes be resolved?

- Neither the U.S. nor Chinese announced tariffs have been implemented yet.
- It is anticipated that trade teams from the U.S. and China will be meeting to better understand the concerns from each side.
- At this writing, there is the potential opportunity to find resolutions to these trade disputes, but that is not assured.

References

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USDA: Foreign Agricultural Service. PS&D and GATS databases



MORE INDIANA SOYBEAN ACRES: GLOBAL REASONS BUT LOCAL IMPLICATIONS

CHRIS HURT, PROFESSOR OF AGRICULTURAL ECONOMICS

Indiana farmers told USDA they would plant a record number of soybean acres in 2018. In fact, this is the sixth consecutive year they have shifted acreage away from corn and toward soybeans in the state. In fact, the state’s soybean acreage has increased nearly one million acres since 2012 and corn has decreased by 1.15 million acres.

Figure 1 provides an illustration of Indiana acreage planted to the four largest acreage crops. Those are soybeans, corn, hay and wheat. These USDA numbers are “planted” acres with the exception of hay which is “harvested acres.”

The first year in the graph is 1996, a significant year in U.S agriculture representing the first year in modern history when government acreage set-asides were eliminated. This was commonly known as the “Freedom to Farm” policy in which both set-asides ended and government payments were designed to avoid incentives to plant a specific crop. Under this policy, government payments were de-coupled from planting incentives and thus market prices directed farmers’ decisions on which crops to plant. The elimination of set-aside acres also meant that all acres

were in production with the exception of the on-going Conservation Reserve Program (CRP).

Why More Soybean Acres?

One question is why is acreage shifting to soybeans and why has this gone on for six years in Indiana? If market forces are providing greater incentives for soybeans then we might look at the expected returns for soybeans versus corn in Indiana. That is precisely what ag economists do each winter in educational meetings using Purdue crop budgets. For several years the expected returns for soybeans have been stronger than for corn. As an example this past winter, the Purdue budgets were showing \$40 to \$60 per acre stronger returns for soybeans versus corn on average quality Indiana soils using yields and costs in our budgets.

Why would soybeans be providing more returns in Indiana than corn? There could be a number of factors to explore but I will start with the growth in global demand for soybeans. The rate of growth in the global usage of soybeans has simply been larger than corn or wheat.

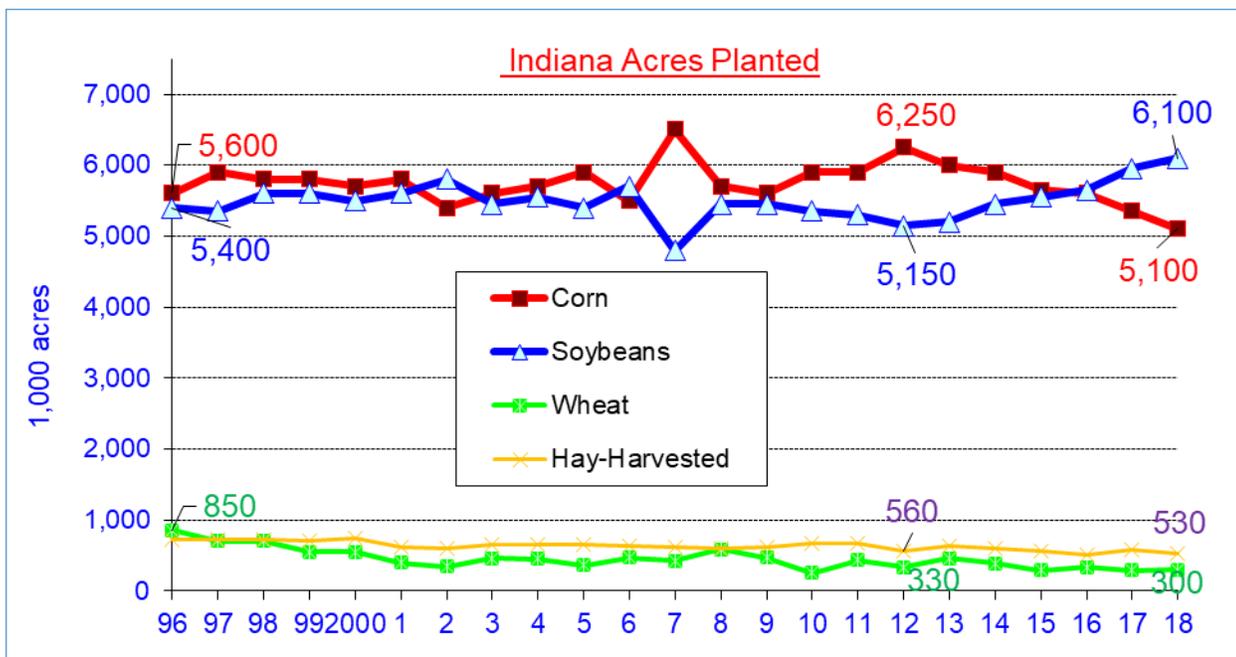


Figure 1. Indiana Planted Acres in 1,000s

If markets are working properly, they should provide prices that give farmers the incentive to plant more of the crops that are most needed. Rapidly expanding usage is one of the factors that could cause a need for more acres.

The global use of soybeans has been outpacing the growth rates of corn and wheat. These annualized

Table 1
World Usage: Growth Rates (Compound Annual %)

	1980's	1990's	2000-2010	2010-2017	1990-2017
Soybeans	2.2%	5.0%	4.0%	4.4%	4.2%
Corn	1.4%	2.5%	3.4%	3.2%	2.8%
Wheat	2.1%	0.6%	1.1%	1.8%	1.0%

Data USDA: PS&D Database

growth rates are shown in Table 1 by time period—mostly decades. Usage growth rates have been the slowest for wheat. For the 27 years from 1990 to 2017, the annual growth rate in global wheat use has been 1% a year. Interestingly, the annual increase in world wheat yield has been slightly more than 1% and as a result world wheat acres have dropped a small amount since 1990 (down 5%).

For corn, the annual growth rate in total usage has been much faster at 2.8% and yields have risen about 1.6% per year. Usage rising faster than yields means more acres of corn have been needed and total world acreage since 1990 has risen 42%. More acreage of corn has been needed in each recent decade, but especially in the decade from 2000 to 2010. That is when most of the buildup in corn usage was needed for ethanol production increases. Global annual usage growth rates surged to 3.4% that decade.

As you already know, the “rock star” of global usage growth has been soybeans. From 1990 to 2017, annual growth rates in world usage averaged 4.2%. The average annual yield increase of 1.2% could not begin to keep up. As a result, many more acres were needed to accommodate this quickly growing market. By 2017, world acreage had increased 2.3 times over 1990. South America provided 60% of the growth representing 105 million added soybean acres. The United States provided 19% of the world expansion or 33 million added soybean acres between 1990 and 2017. The most recent growth rate in soybean usage from 2010 to 2017 has been a very strong 4.4% per year.

What is the source of the usage expansion? Soybeans have strong usage growth rates for a number of rea-

sons including growing incomes in developing countries. As those incomes rise, consumers eat more animal-based products and more animal production requires more soybean meal. Biodiesel programs in Europe and the United States have increased the usage of vegetable oils like soybean oil. China is the geographic center of increased soybean use as that single country represents 43% of the world’s soybean use growth from 1990 to 2017. So to predict future soybean usage growth rates we would turn to predications of world income growth, biodiesel programs and to China.

USDA estimates real world economic growth in the next decade will accelerate, rising to 2.9% annually compared to 2.3% for the past decade. China’s real economic growth is expected to remain at a strong rate of 5.5% per year, but is slower than the 8.2% growth rate of the past decade.

Implications of More Indiana Soybean Acres

Indiana soybean acres have been growing in each of the past six years. One of the likely reasons is that world soybean usage rates have been growing faster than those for corn and wheat. Secondly, world yields of soybeans have not improved as fast as corn, so more world soybean acres are needed to keep up with the soybean usage growth. Some of those acres are in the U.S. and some in Indiana. Indiana soybean acres are already high and a continuing trend to even more Indiana acres may occur if current world economic growth accelerates as expected. What are some implications of high Indiana soybeans acres for input suppliers, farmers, and our marketing sectors?

Higher soybean acres imply greater soybean seed production relative to corn seed and other crops. More soybeans mean fewer inputs would be needed. There is less fertilizer use in the state especially nitrogen fertilizer. Less fuel is needed as soybean production requires less machine fuel and dryer fuel compared to corn. More soybean acres mean less lender debt for operating loans. More soybeans suggest a potential downsizing of several Indiana input industries.

For farmers, more soybean acres relative to corn forces them to re-think a 50/50 corn/soybean rotation perhaps considering a rotation of 2-years beans and 1-year of corn. Heavier bean acreage may change optimum machinery requirements for planting and harvesting. The much smaller volume of soybean bush-

els per acre versus corn means that hauling equipment needs are sharply reduced. A heavy soybean farm also sharply reduces on-farm storage space requirements. On sloping soils prone to erosion, the limited residue from soybeans compared to corn may imply re-thinking conservation practices.

The marketing sector will feel the impacts of greater bean acres in 2018 and maybe beyond. Less commercial storage space will be needed. In 2018 with one million more Indiana acres in soybeans than corn, over 100 million less bushels of storage capacity will be needed than when corn/soybean acreage was 50/50. There will be more intensity of harvest activity around soybean harvest and less around corn. Total bushels going through grain handling facilities will drop and that tends to increase costs per bushel for grain elevators. Even end users will be affected as less corn means final users like ethanol plants and the animal industry have stronger competition for corn bushels.

I have made an argument for a continuation of the expansion of soybean acres in Indiana relative to corn and wheat. This trend has major implications for future capital investments in machinery, storage, and plant investments in the state. But, a host of other factors could be drivers that were not discussed and could shift the trend. Early in 2018, China is proposing tariffs on U.S. soybeans. Such an action would cause a major re-configuration of where soybeans are produced in the world. Also, Argentina suffered substantially reduced soybean production in early 2018 due to dry weather. This increased soybean prices and gave U.S. farmers stronger incentives to plant soybeans in 2018. While predicting whether the trend to more Indiana soybeans will continue, it is important to be aware of these trends, to continue to observe their direction in future years, and to remain cautious regarding capital investments that may be impacted.



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86th Annual Purdue Farm Management Tour

June 21-22, 2018

Johnson and Shelby counties

The Department of Agricultural Economics has organized the Indiana Farm Management Tour every year since the early 1930s. The tour visits farms that have demonstrated highly successful farm business management practices or have unique perspectives on farm business management.

Host farmers share keys to successful farm management and explain how the management of their operations is changing in response to the ever-changing agricultural economy and the evolving circumstances of their families. They also share reasons behind recent innovations in production practices and adoption of new technology. This is an opportunity to learn from the experiences of Indiana's best farm business managers.

June 21 - Johnson County

1:00 p.m. Gill Farms

6184 E Greensburg Road, Franklin, Indiana

The Gills operate a grain and cattle operation. They produce specialty crops including seed corn and waxy corn utilizing irrigation. Specialty crops and irrigation enhance profitability and mitigate risk. You will learn about their crop fertility program, waxy corn production, and seed corn production.

3:30 p.m. Norton Farms

3620 N. Hurricane Road, Franklin, Indiana

Norton Farms operates a multi-enterprise farm including flowers, produce, corn, soybeans, seed soybeans, waxy corn, popcorn and a grain elevator. Topics for discussion will include the advantages of mul-

tiples enterprises; how the varied enterprises work together; the role of the individual family members; and specialty crop production.

June 22 - Shelby County

8:30 a.m. Douglas Farms

9596 S 350 E, Flat Rock, Indiana

Douglas Farms is a multi-generation family farm raising corn-soybeans and finishing hogs. You will see how their multi-family operation is organized and hear about their succession plan to transfer ownership and operation. Their innovative new farm shop will also be featured.

11:30 a.m.

Fischer Food Grade Inc. and Fischer Seed Inc.

3387 S 375 E, Shelbyville, Indiana

The Fischer family are growers and processors of GMO and non-GMO food grade corn, soybean seed and non-GMO food grade soybeans. You will see their facilities to handle and process seed and food grade corn and hear how they improve long-term soil productivity.

Purdue Farm Management Tour Pre-registration Information

The public is invited. Pre-registration is required to participate in the farm tour lunch on June 22. There is no fee for attending the Purdue Farm Management Tour and the lunch on June 22.

Go to <https://ag.purdue.edu/commercialag/pages/programs/Farm-Tour.aspx>

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