PURDUE AGRICULTURAL ECONOMICS REPORT

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Indiana Farmland Values Continue to Increase

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The 2001 Purdue Land Values Survey indicates that the value of an acre of average bare Indiana cropland was $2,264 per acre in June 2001. This was $91 more than the value reported in June 2000, a 4.2 percent increase. Cash rents increased from 1999 to 2000 on average land by a little less than 1 percent to $113 per acre.

Statewide Land Values

For the *six months* ending in June 2001, the value of bare tillable land was reported to have increased 1.3 percent on top land, 1.0 percent on average land, and 1.2 percent on poor land (Table 1). While only a small upward change, these numbers indicate that the land values are holding strong in spite of continued low grain prices. Thirty-five percent of the survey respondents indicated that all classes of land (top, average, and poor) were the same or higher during the December 1, 2000 to June 1, 2001 period. Eleven percent of the respondents indicated that some or all classes of land fell in value and 49 percent indicated that land values remained unchanged during the December 1, 2000 to June 1, 2001 period. Compared to last year's survey, more respondents indicated that land values were increasing and fewer respondents indicated a decline.*

The statewide *12-month* increase in average value from June 2000 to June 2001 was 4.2 percent (Table 1). Top-quality land (159 bushel corn yield rating) was estimated to have increased by $87 per acre to $2,802 (Table 1). Average land (129 bushel corn yield rating) was valued at $2,264, an increase of $91, while poor land (99 bushel corn yield rating) was estimated to be worth $1,733 per acre, an increase of $103.

The land value per bushel of corn yield rating also increased this year. For top-quality land, the value per bushel of yield was $17.67, up by 2.3 percent. Average quality land value was $17.53 per bushel, while the poor quality value was $17.42 per bushel (Table 1). The percentage increases were 2.9 percent on average land and 4.3 percent on poor land. These per-bushel figures are $0.39 higher than last year on top land, $0.49 higher on average land, and $0.72 higher on poor land.

The value of transition land** also exhibited an increase. The average value of transitional land in June 2001 was $6,627, an increase of 1.5 percent from June 2000. For the six-month period from June 1, 2000 to December 1, 2000 transitional land values declined. However in the in the latter half of the year, December 1, 2000 to June 1, 2001, transitional land increased by 3.1 percent (Table 1). Due to the wide variation in estimates (from $900 to $35,000 in June, 2001), the median value may give a more meaningful picture than the arithmetic average. The median value of transitional land in June 2001 was $5,250 per acre more than reported in June 2000.

Statewide Rents

Cash rents increased statewide from 2000 to 2001 by $1 per acre on all classes of land (Table 2). The estimated cash rent on top land was $141 per acre, $113 per acre on average land, and $87 per acre on poor land. Rent per bushel of estimated corn yield was $0.89 on

In This Issue

** In the 2000 survey, 32% of the respondents indicated land values were the same or increasing and 13% indicated that land values declined.*

*** Transitional land is land that is moving out of agriculture.*

Table 1. Average Estimated Indiana Land Value Per Acre (Tillable, Bare Land) and Per Bushel of Corn Yield, Percentage Change by Geographic Area and Land Class, Selected Time Periods, Purdue Land Values Survey, June 2001[1]

			Land Value					Land Value/Bu			Projected Land Value	
			Dollars Per Acre			% Change				% Change		% Change
Area	Land Class	Corn bu/A	June 2000 $/A	Dec 2000 $/A	June 2001 $/A	6/00-6/01 %	12/00-6/01 %	$ Amount 2000 $	$ Amount 2001 $	6/00-6/01 %	Dec. 2001 $	6/01-12/01 %
North	Top	158	2,638	2,662	2,704	2.5%	1.6%	16.96	17.15	1.1%	2,676	-1.0%
	Average	125	2,040	2,090	2,121	4.0%	1.5%	16.33	16.96	3.9%	2,097	-1.1%
	Poor	92	1,413	1,544	1,552	9.8%	0.5%	15.14	16.82	11.1%	1,531	-1.4%
Northeast	Top	156	2,630	2,699	2,711	3.1%	0.4%	16.94	17.41	2.8%	2,664	-1.7%
	Average	128	2,062	2,130	2,133	3.4%	0.1%	16.37	16.64	1.6%	2,094	-1.8%
	Poor	99	1,595	1,607	1,635	2.5%	1.7%	16.52	16.48	-0.2%	1,615	-1.2%
W. Central	Top	157	2,786	2,807	2,823	1.3%	0.6%	17.61	17.96	2.0%	2,812	-0.4%
	Average	131	2,289	2,332	2,329	1.7%	-0.1%	17.52	17.73	1.2%	2,312	-0.7%
	Poor	103	1,681	1,735	1,742	3.6%	0.4%	16.55	16.87	1.9%	1,726	-0.9%
Central	Top	165	3,006	3,088	3,135	4.3%	1.5%	18.43	19.06	3.4%	3,154	0.6%
	Average	136	2,519	2,596	2,631	4.4%	1.3%	18.76	19.35	3.1%	2,643	0.5%
	Poor	107	2,035	2,111	2,154	5.8%	2.0%	19.39	20.05	3.4%	2,164	0.5%
Southwest	Top	166	2,663	2,731	2,801	5.2%	2.6%	16.54	16.92	2.3%	2,843	1.5%
	Average	129	1,981	2,105	2,146	8.3%	1.9%	15.70	16.64	6.0%	2,207	2.8%
	Poor	95	1,330	1,446	1,472	10.7%	1.8%	14.39	15.55	8.1%	1,519	3.2%
Southeast	Top	149	2,185	2,383	2,426	11.0%	1.8%	15.35	16.29	6.1%	2,484	2.4%
	Average	118	1,808	1,959	2,000	10.6%	2.1%	15.65	16.96	8.4%	2,071	3.6%
	Poor	91	1,429	1,576	1,585	10.9%	0.6%	16.17	17.34	7.2%	1,641	3.5%
Indiana	Top	159	2,715	2,767	2,802	3.2%	1.3%	17.28	17.67	2.3%	2,804	0.1%
	Average	129	2,173	2,242	2,264	4.2%	1.0%	17.04	17.53	2.9%	2,269	0.2%
	Poor	99	1,630	1,712	1,733	6.3%	1.2%	16.70	17.42	4.3%	1,736	0.2%
	Trans.[2]		6,532	6,428	6,627	1.5%	3.1%				6,820	2.9%

1 The land values contained in this summary represent averages over several different locations and soil types. If a precise value is needed for a specific property, this value can be determined by a professional appraiser.

2 Transition land is land moving out of production agriculture.

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top land and $0.88 on average land and $0.87 on poor land. This value is the same as the 2000 values for top and average land and is a 1¢ decrease for poor land. Statewide, cash rent as a percentage of estimated land value decreased. For 2001, cash rent as a percentage of value was 5.0 percent for all land classes. (Table 2).

Area Land Values

Changes in the value of farmland in the six different geographic areas of Indiana (Figure 1) for December 1, 2000 to June 1, 2001, ranged from a slight decline (-.1% for average land in West Central Indiana) to an increase of 2.6 percent for top land in the Southwest region (Table 1). For the December 1, 2000 to June 1, 2001 period, all regions reported slight to moderate increases in farmland values. The Southwest region reported the strongest increases for this six-month period, ranging from 1.8 to 2.6 percent. This is a sharp contrast to last year, when declines for all land types was reported for the Southwest. The West Central region had only slight changes in land values for the December 1, 2000 to June 1, 2001 period. As noted previously this was the only region to report a decline in land values.

For the year ending June 1, 2001, the change in land values ranged from a 1.3 percent increase in top farmland in the West Central region to an 11.0 percent increase for top land in the Southeast region. All regions except the West Central and Northeast regions reported strong increases in some or all land types for the year ending in June 2001. The changes in land values for West Central and Northeast Indiana were still positive, but smaller than those reported in other regions.

The highest valued top-quality land was in the Central area, $3,135 per acre. The next highest values were in the West Central ($2,823), Southwest ($2,801), Northeast ($2,711), and North ($2,704) regions. Reported values for average quality land were $2,631 in the Central area, $2,329 in the West Central area, and around $2,100 in the North, Northeast, and Southwest regions.

Land value per bushel of estimated average corn yield (land value divided by bushels) on top land in the Central region was $19.06. For the West Central, North, and Northeast regions, land value per bushel of corn yield on top land ranged from $17.15 to $17.96. In the Southeast and Southwest, land value per bushel of corn yield on top land ranged from $16.29 to $16.92 (Table 1). The pattern in the land value per bushel for other land classes was similar.

Respondents were asked to estimate the value of rural home sites with no accessible gas line or city utilities and located on a black top or well-maintained gravel road. The median value for five-acre home sites ranged from $5,000 to $6,250 per acre (Table 3). Estimated per acre median values of the larger tracts (10 acres) ranged from $4,000 to $6,000 per acre.

Area Cash Rents

All regions except the Northeast reported increases in cash rents for the year (Table 2). The strongest increases in cash rents occurred in the Southeast, increasing 3.1 percent on poor land, 3.6 percent on average land, and 3.8 percent on top land. The Central region reported the next strongest increases, ranging from a 2.0 percent increase on poor land to a 2.7 percent increase on top land. The North, Northeast, and West Central regions each had a mixture of increases, decreases for no change in cash rents. For this group of regions the largest decrease was reported for poor land in the Northeast, a decline of 2.4 percent. The largest increase was for poor land in the West Central region, 2.1 percent.

Table 2. Average Estimated Indiana Cash Rent Per Acre, (Tillable, Bare Land) 2000 and 2001, Purdue Land Value Survey, June 2001

			Rent/Acre		Change	Rent/bu. of Corn		Rent as % of June Land Value	
Area	Land Class	Corn bu/A	2000 $/A	2001 $/A	'00-'01 %	2000 $/bu.	2001 $/bu.	2000 %	2001 %
North	Top	158	140	142	1.4%	0.90	0.90	5.3	5.3
	Average	125	111	110	-0.9%	0.89	0.88	5.4	5.2
	Poor	92	81	82	1.2%	0.87	0.89	5.7	5.3
Northeast	Top	156	132	132	0.0%	0.85	0.85	5.0	4.9
	Average	128	105	104	-1.0%	0.83	0.81	5.1	4.9
	Poor	99	82	80	-2.4%	0.85	0.81	5.1	4.9
W. Central	Top	157	153	151	-1.3%	0.97	0.96	5.5	5.3
	Average	131	127	128	0.8%	0.97	0.97	5.5	5.5
	Poor	103	96	98	2.1%	0.94	0.95	5.7	5.6
Central	Top	165	150	154	2.7%	0.92	0.94	5.0	4.9
	Average	136	123	126	2.4%	0.92	0.93	4.9	4.8
	Poor	107	99	101	2.0%	0.94	0.94	4.9	4.7
Southwest	Top	166	136	140	2.9%	0.84	0.85	5.1	5.0
	Average	129	106	107	0.9%	0.84	0.83	5.4	5.0
	Poor	95	76	76	0.0%	0.82	0.80	5.7	5.2
Southeast	Top	149	105	109	3.8%	0.74	0.73	4.8	4.5
	Average	118	83	86	3.6%	0.72	0.73	4.6	4.3
	Poor	91	64	66	3.1%	0.72	0.72	4.5	4.2
Indiana	Top	159	140	141	0.7%	0.89	0.89	5.2	5.0
	Average	129	112	113	0.9%	0.88	0.88	5.2	5.0
	Poor	99	86	87	1.2%	0.88	0.87	5.3	5.0

Cash rents were again highest in the Central and West Central areas at $154 and $151 per acre, respectively, for top land. Cash rents per bushel for the West Central and Central regions ranged from $0.93 to $0.97. These were also the highest in the state. The next highest per-bushel rent was in the North, ranging from $0.88 to $0.90 per bushel. The per bushel rents in the Northeast and Southwest ranged from $0.82 to $0.85. The lowest per bushel cash rents were reported for the Southeast, ranging from $0.72 to $0.73.

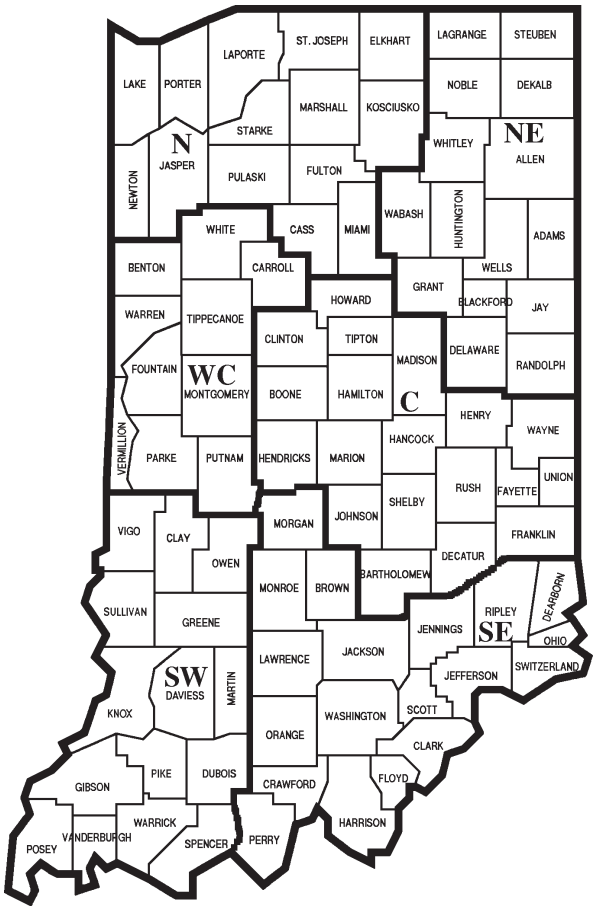
Land Market Activity

There are several factors that influence farmland prices. The supply of land on the market, the eagerness of buyers to make purchases, expectations about grain prices, rate of inflation, and interest rates are just a few examples. To assess the supply of land on the market, respondents were asked to indicate the amount of farmland on the market compared to a year

Table 3. Median Value of Five-Acre Home Sites and Home Sites of 10 Acres or More

	Median Value, $ per acre									
	Under 5 Acres					10 Acres & Over				
Area	1997 $/A	1998 $/A	1999 $/A	2000 $/A	2001 $/A	1997 $/A	1998 $/A	1999 $/A	2000 $/A	2001 $/A
North	5,000	5,000	5,000	5,000	5,250	4,250	4,000	5,000	5,000	5,000
Northeast	4,250	5,000	5,000	5,000	5,000	4,000	4,000	4,000	4,500	4,500
West Central	5,000	5,000	5,000	5,000	5,000	5,000	4,700	4,000	5,000	5,000
Central	5,000	5,000	5,000	6,000	6,250	4,500	5,000	5,000	5,500	5,000
Southwest	4,250	5,000	5,000	5,000	6,000	5,000	4,500	5,000	5,000	6,000
Southeast	4,000	5,000	5,000	5,000	5,000	3,500	3,000	3,750	4,000	4,000

Figure 1. Geographic Areas Used in the Purdue Land Values Survey



earlier (Figure 2). The respondents indicated there was more, less, or the same amount of land compared to a year earlier. For the last three years the majority of the respondents have indicated that the amount of land on the market was the same as the previous year. Nearly a third indicate that there is less land on the market (Figure 2). Just over 10 percent indicate an increase. The most noticeable changes in the response to this question were the increase in the percent of respondents that indicated a decrease in land available and the decrease in the percent of respondents that indicted an increase in land available in 2000. In the 2001 survey, there was an increase in the number indicating more land on the market and a decrease in the number indicating less.

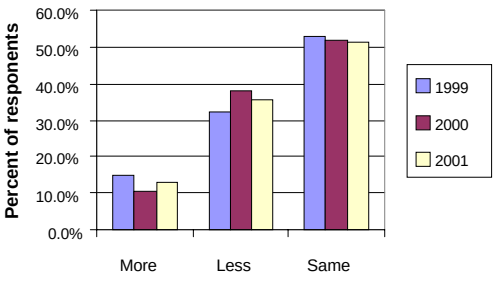
Respondents were also asked to provide their assessment regarding the number of farmland transfers during the previous six months compared to a year ago. Again, they were asked if the number of transfers had increased, decreased, or remained the same. Twenty-two percent of the respondents indicated that the number of transfers increased, 29 percent indicated that the number of transfers declined and 49 percent indicted that the number of transfers were the same.

Respondents were asked to provide their perceptions of how the purchasers of farmland had changed from a year earlier. Demand from farmers was said to have increased by 22 percent of the respondents, while 19 percent of the respondents indicated that farmer demand had declined. In 2000, 26 percent of the respondents indicated an increase in farmer demand, while 17 percent indicated a decline.

Seventy-six percent of the respondents indicated an increase in demand for rural residences. While this is less than the 83 percent that reported an increase last year, it still indicates a strong demand for rural residences. Three percent of the respondents indicated a decrease in demand for rural residences, while 21 percent indicated no change. Twenty-seven percent of the respondents indicated that individual nonfarm investors in farmland had increased, while 17 percent indicated that this source of demand had decreased. In 2000, 32 percent of the respondents indicated an increase from individual nonfarm investors, while 19 percent indicated a decrease in demand from individual nonfarm investors.

The purchase of farmland by pension funds and other large investors is always a topic of discussion. Compared to a year ago, 10 percent of the respondents indicated that demand from this source had increased, 30 percent indicated a

Figure 2. Amount of land on market compared to one year ago



decrease, and 60 percent indicated no change. These are similar to the numbers reported in 2000, when eight percent of the respondents indicated an increase and 28 percent indicated a decrease.

Expectations regarding intermediate crop prices have a strong influence on farmland values because of their affect on the expected return to the land investment and the expected cash flows associated with the investment purchase. In order to gain some insight into the income level expected from a land purchase, respondents were asked to estimate annual average prices over the next five years for corn and soybeans. Respondents have made these projections since 1984 (Table 4).

Another decrease occurred in the expected five-year average price of corn and soybeans. The price of $2.12 for corn and the $5.07 are the lowest expected 5-year prices in the 18-year series. To the extent that land market participants have similar reduced expectations, these lower price expectations will exert downward pressure on land values.

Other important expectations associated with a land purchase include the expected farm mortgage interest rate and the rate of inflation. The estimated interest rate declined this year, dropping a full percentage point. This is the lowest expected interest rate in the series. The decline in interest rates has a positive affect on land values. The expected rate of inflation also declined.

There are several other items that can influence farmland values. Survey respondents were asked to assess the influence of 11 different items on farmland values. These items included:

1. Current net farm income,
2. Expected growth in returns,
3. Crop prices & outlook,
4. Livestock prices & outlook,
5. Current & expected interest rates,
6. Returns on competing investments,
7. U.S. agricultural export sales,
8. U.S. inflation/deflation rate,
9. Current inventory of land for sale,
10. Current cash liquidity of buyers, and
11. Current U.S. agricultural policy.

Respondents were asked to use a scale for a -5 to +5 to indicate the affect that each item had on farmland values. If the item had a major negative influence, it would be given a -5. If the item had a small negative influence, it would be given a -1. Positive influences were assessed in the same way, except positive weights were used. An average for each item was calculated. The results are presented in Figure 3. The numbers on the horizontal axis of the chart indicate the number of the influence in the list above.

Those items with the largest negative influences included current net farm income (1) and the crop price level and outlook (3). Those with the largest positive influences included current and expected interest rates (8), the current inventory of land for sale (9), and the current cash liquidity of buyers (10).

Land Value/Cash Rent Multiples

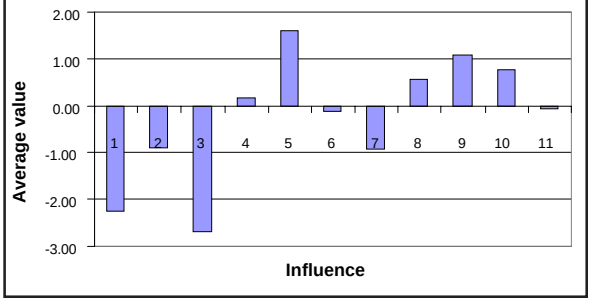
While the recent change in the value of farmland has a strong influence on land value's future direction, Figure 3 indicates that the current annual return to a land investment and the expected future return also have important influences. One way to assess the relationship between the annual return for a land investment and farmland values is to observe the land value/cash rent multiple. This is similar to the "price/earnings ratio" often referred to by stock market analysts. For example, data from the 2001 Purdue survey indicates a value/rent multiple of 20.0 ($2,264 ÷ $113 = 20.04) for average land. Is this figure abnormally high, thus suggesting that land values are too high? To answer this question we need to have an estimate of what is "normal."

For the period 1975 to 2001, the value to rent multiple has ranged

Table 4. Projected Five-Year Average Corn and Soybean Prices, Mortgage Interest and Inflation

	Prices, $ per bu.		Rate, % per year	
Year	Corn	Beans	Interest	Inflation
1984	$3.13	$7.35	13.3%	6.5%
1985	2.70	6.13	12.3%	5.1%
1986	2.32	5.43	11.0%	4.2%
1987	2.16	5.62	10.7%	4.5%
1988	2.50	6.82	10.9%	4.6%
1989	2.48	6.55	11.0%	4.7%
1990	2.61	6.22	11.0%	4.6%
1991	2.47	6.07	10.4%	4.2%
1992	2.52	6.04	9.5%	3.8%
1993	2.35	5.96	8.7%	3.8%
1994	2.48	6.18	8.9%	3.8%
1995	2.50	6.02	9.2%	3.9%
1996	3.01	6.63	9.1%	3.7%
1997	2.72	6.81	9.0%	3.4%
1998	2.54	6.34	8.6%	3.1%
1999	2.31	5.57	8.4%	2.9%
2000	2.28	5.56	9.1%	3.2%
2001	2.12	5.07	8.1%	2.9%
Average	$2.51	$6.13	10.0%	4.1%

Figure 3. Factors influencing land values



from a low of 12.4 in 1986 to a high of 20.6 in 1979 (Figure 4). Over the 1975 to 2001 period, the value to rent multiple averaged 16.3, with a standard deviation of 2.6. At a multiple of 20, the value to rent multiple is in a range similar to that in the 1978 to 1981 period. If one assumes that the value to rent multiple is normally distributed, this means there is only an eight percent chance that a higher value will be achieved. Or looking at it from the other side, there is a 92 percent chance of a lower value to rent multiple. Since 1975, the land value to rent multiple has exceeded 19.0 in eight years (1978-1981 and 1998-2001), indicating that the value to rent multiple is more likely to decline than increase.

Concluding comments

In spite of continued low grain prices, land values and cash rents continue to be strong or even increase. Survey respondents' revised downward their expected intermediate term grain prices and production costs continue to increase. This places downward pressure on land values and cash rent. However, intermediate term crop yields continue to increase, the federal government continues to provide emergency financial assistance, and long-term interest rates are declining. How much longer will land values continue to hold steady or rise in the face of dim income prospects? There are several possible answers to this question. Here are three for your consideration.

First, farmland values and cash rent will remain at about their current levels as long as the federal government continues to provide emergency income support payments to farmers and tie these support payments to land. While survey respondents view the current farm program as having a slightly negative influence on land values and cash rents, agricultural economists continue to argue that annual emergency government payments and loan deficiency payments have prevented land values and cash rents from adjusting downward. While these payments are made to farm operators, much of the payment has been quickly capitalized into land values or bid into cash rents.

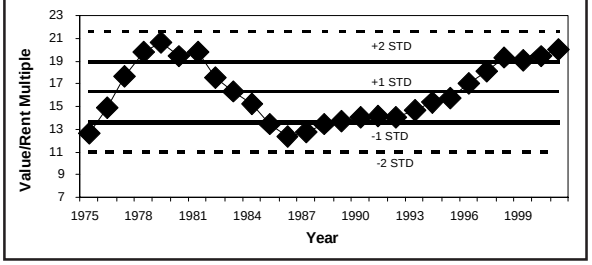
"Freedom to Farm" will expire in 2002. The discussion of alternatives has begun. While the exact form of the future program is not known, nearly everyone expects there to be some form of farm income support and that the level of support will continue at current levels. While this "conventional wisdom" may be correct, there is uncertainty associated with political processes. This may be a good time to begin the development of contingency plans in case the "conventional wisdom" is wrong.

Second the strong nonfarm economy has created a strong real estate development demand. It has also resulted in a strong demand for country homes and recreational land. To avoid paying taxes on land sold to developers, many sellers of farmland have made a tax-free real estate exchange. This has created strong demand for farmland away from cities and towns. With the slowing of the nonfarm economy, the development demand for farmland is expected to slow, reducing the demand for farmland needed for tax-free exchanges.

Finally, expectations are an important part of the farmland market. Many view the current low grain prices as the departure from the norm rather than the norm. As long as operators expect grain prices to improve in the near term, they are often willing to bid a little extra to gain control of land - hoping short-term losses will be offset by long-run gains. In the short-run, this often results in operators accepting less than full payment for their contributed labor, management, and capital. There is also an expectation that farmland values will increase over time. When asked where they expect farmland values to be five years from know, 65 percent of the survey respondent said higher. Twenty-one percent indicated they would be the same and 14 percent indicated that land values would be lower. The overall expected percentage change was 8.1 percent.

How much influence can expectations have on market values?

Figure 4. Value to Rent Multiple for Average Indiana Land, 1975-2001



Remember the Internet stock boom? Market values for these companies rose steadily in spite of large losses because market participants expected (hope for) future profits. After all, these were companies associated with the new economy. Investors in these companies considered it acceptable for these new companies to have losses as long as there was a plan for becoming profitable. Eventually investors became weary of waiting and there was a major correction in this market. How will the farmland market react if market participants decide that $2.00 is the normal price for a bushel of corn and there is little expected increase in land values? What are your plans if such a correction should occur?

A strong demand for the quantity of land that is supplied to the market, the provision of emergency government payments, good yields, low interest rates, the desire of operators to expand the size of their business, and expanding non-agriculture economy, and the expectation that prices and farm profitability will improve are factors that have allowed land values and cash rents to remain strong. Until something changes in this picture, the recent trend of steady to slowly increasing cash rents and land values is likely to continue.

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The land values survey was made possible by the cooperation of professional farm managers, appraisers, brokers, bankers, Purdue Extension educators, and persons representing the Farm Credit System, the Farm Service Agency (FSA) county offices, and insurance companies. Their daily work requires that they stay well-informed about land values and cash rents in Indiana. The authors express sincere thanks to these friends of Purdue and Indiana agriculture. They provided 353 responses representing nearly all Indiana counties. We also express appreciation to Carolyn Hunst of the Department of Agricultural Economics for her help in conducting the survey.

Changes in the Federal Estate Tax

Gerald A. Harrison, Extension Economist

One might introduce this discussion with excitement since the recent tax legislation includes provisions to suspend the federal estate tax in 2010. However, the same recent change also reinstates the estate tax in 2011, unless Congress acts to revise the law. But, we do have estate tax relief on the horizon. Farmland owners and farm and ranch businesses already had important relief in the federal tax law via special use valuation of farm and ranch land, and by the family owned business interest deduction. These two provisions may lift the estate tax from most farmers and retired farmland owner's estates especially for farm couples who split ownership—rather than allow one spouse to take full title by right of survivorship.

Current Situation

Special use valuation (SUV) for decedents in the year 2001 allows up to $800,000 of farmland value to be subtracted from a decedent's estate tax estate—with a formula that figures the value of land by dividing average cash rent, less land taxes, for comparable land in the community then divided by a land bank interest rate that is 8.13% for year 2001 decedents. There is a new tax law provision for past SUV elections that suffered recapture of an estate tax savings for violating what was the "no cash rent" rule. In cases, where the family members could not get a refund from the IRS after the "no cash rent" rule was lifted by 1997 legislation because of a statute of limitation or any other rule blocking the refund, there is a year that started June 7, 2001 to seek a refund.

In addition, the family owned business interest deduction (FOBID) for which the qualifications are similar to the special valuation rule allows a deduction from the estate tax estate of $675,000 in closely held business interest assets. The law places a $1.3 million cap on FOBID and the applicable exclusion amount. In 2004 the AEA (exemption) alone exceeds $1.3 million at which time FOBID is repealed. SV plus FOBID, and the AEA amount allows a landowner to leave over $2 million through an estate without a federal estate tax.

Revised Law

The highest federal estate and gift tax schedule rate of 55% (for taxable amounts above $3 million) is reduced to 45% (4th column in Table 1). Another major change is that the applicable exclusion amount (an "exemption" it is often called). It will rise from $675,000 in 2001 to $1 million in 2002 (Table 1). The exemption (actually a credit against the federal estate tax) moves on up to $3.5 million by 2009! And then the estate tax is repealed for just the year 2010. The new law holds the gift tax exemption at $1 million for lifetime gifts. In 2010, the highest rate becomes 35% for gifts, and kicks in at $500,000. The separate death-time, generation-skipping tax exemption (GST) is the same as the estate tax exemption.

The income tax basis step-up rule remains through 2009. However, in 2010 with what may be a temporary repeal of the estate tax, the basis rule is changed to generally require a carry-over of income tax basis to the heirs. There are large exceptions,

Continued, page 9.

Windpower: "Green" Source of Electricity or Just a Lot of Air?

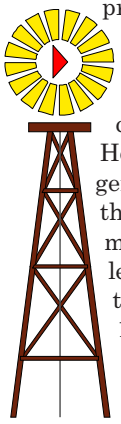
Stephen B. Lovejoy, Professor

One of the newest energy sources (and also one of the oldest) appears to be windpower. There have been many recent media stories concerning the advantages of wind for generating electricity compared to conventional energy sources (e.g., coal, oil, hydro or nuclear). A recent TV news program used Clint Eastwood to extol the virtues of windpower as a more natural way to harness nature to provide electrical power. Avoiding the environmental problems associated with both obtaining and burning fossil fuels makes windpower seem like an ideal "green solution". Both the U.S. EPA and DOE recommend windpower as a clean, safe, reliable, and low cost method of generating electricity.

We increasingly read about wind farms being constructed utilizing the latest in blade design and turbine technology which are characterized as providing clean power and acting as a new crop for farmers, Indian tribes, and other landowners. Information on site selection and planning are available from several companies that can supply complete systems from towers, rotors, converters, turbines, batteries and connections to the power grid. Some of these companies market windpower as a new enterprise that can help rural residents increase their incomes and reduce their income risk while being "nature friendly".

Of course, many of us remember the days when many farms utilized windmills to pump water, but the technology we remember is a great leap behind today's more efficient technology. An analogy might be the windmills of the past are an abacus while today's wind turbines are supercomputers.

But how much of this information is media hype and how much is real? Will windpower become a significant source of electricity in the coming years? Is it more environmentally sound? Is it free, or nearly free, power?



Although some new designs are promising greater capacity, a typical modern windmill turbine is capable of running 24/7 and at a capacity of 660 kwh. However, these windmills generate power only when the wind speed is over 30 mph. This capacity factor leads to the typical wind turbine generating about 1,000,000 kwh per year. Of course, most modern wind farms have multiple windmills and turbines, thereby generating several times that quantity per farm. In Wisconsin, where several wind farms are located, a typical wind farm with 17 windmills generated 22,500,000 kwh in a 12-month period (Schleede, 2001). A Hoosier wind farm generating over 20 million kwh per year sounds impressive until compared with the total sales of electricity in Indiana. In 1999, utilities in Indiana sold over 142,000 gwh of electricity, that is, 142,000,000,000 kwh of electricity (IURC, 2001).

To supply even 20% of the 1999 demand, the State of Indiana would need over 1,200 wind farms with nearly 22,000 windmills and turbines. In Wisconsin, windmills supplied only 0.082% of the total electricity production in 1999; with the addition of proposed wind farms, that will rise to 0.286% of total 1999 production.

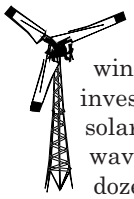
Electricity generated by windpower is also more expensive to produce than electricity produced by conventional sources. A windmill (rotor, tower, and turbine) that can generate one million kwh/yr. can easily cost nearly $1,000,000; an investment of $1 per kwh is considerably greater than for other types of electricity-generating facilities. This is the reason for a myriad of tax breaks, direct subsidies, and recent programs to enable consumers to pay more for "cleaner" power (often called "green pricing"). Many European countries give investment tax credits for new wind-generation capacity while the U.S. provides a 10-year tax credit of 1.5 cents/kwh for power actually generated. In addition, some cities and states provide additional income and/or property tax credit for "clean windpower." Several utilities have recently proposed that if consumers were willing to pay slightly more for all kwh (irrespective of source), the utility would pledge to increase the proportion of electricity generated by these "green sources" (including wind). In Wisconsin, consumers can choose to pay ½ cent to 2 cents more per kwh; the utility uses the additional income to build more renewable energy capacity than they would otherwise build.

The logic is that since generating electricity with wind does not lead to emissions of air pollutants, it is worth paying more. This derives from the fact that the pollutants are unpriced externalities that impose costs on the general public; if the pollutants are not generated, there is a benefit.

While true that windmills do not emit pollutants like SO2, NO2, and CO2, the untold story is that the manufacture and servicing of the towers, turbines, and blades do emit pollutants. Each windmill utilizes over 100,000 lbs. of steel for the tower, over 3,000 lbs. of fiberglass and epoxy for the 154 ft. diameter rotors, and needs a 45,000 lb. generator. These units require regular servicing as well as repair work when heavy winds or bird strikes produce any slight deflection in the surface of the rotor (even slight changes in deflection angles or surfaces can significantly degrade performance).

In addition, decreased concentration of the electrical production may require transmission over greater distances leading to higher transmission costs and losses. Without a full life-cycle analysis of wind-generated electricity, it is difficult to know how much actual pollution would be avoided during the windmill's estimated 20-year lifespan.

What is known is that thousands of windmills would provide only a small portion of our electrical needs but would cost more to produce and pose a danger to many species of birds. In addition, some might view the wind farms as an eyesore, and homes nearby would definitely experience an increase in ambient noise levels.



While burning fossil fuels may not be the "BEST" way to produce electricity, is windpower? Should we be investing in windpower, solar, hydrogen fuel cells, wave power, fusion or one of dozens of other possible technologies? These are the questions we should be asking ourselves.

The bottom line is that windpower may eventually make a large contribution to the generation of electricity, especially in isolated areas. However, we should question whether our current dollars (tax breaks and direct subsidies) should be thrown to the wind or invested in better technology for generation, transmission, and consumption of electricity.

References

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Continued from page 7.

however, that will permit step-up in basis in an individual's estate on assets worth $1.3 million for a decedent and $4.3 million if there is a surviving spouse—allowing most estates to avoid the carry-over basis rules.

Lastly, Indiana still has an Inheritance tax and SUV and FOBID do not apply to the Indiana inheritance tax. While the exemption is $100,000 per closely related heir (e.g., child or grandchildren), decedents with taxable estates of a million or two with the transfer to very few heirs will have a sizable Indiana inheritance tax liability.

Implications

For now, most farmers continue to have little or no federal estate tax liability especially if they have a spouse with which to divide land and other farm business interests. As the exemption amount increases, farmers and other individuals of modest wealth are not likely to have an estate tax liability. This may be true without electing SUV or FOBID. In fact, starting in 2004, we can forget the FOBID complexity—a move toward tax simplicity.

Since one cannot predict death before the end of 2010, one must not totally discount the estate tax. Many planning alternatives consistent with an individual's goals exist to help avoid a future estate tax.

Table 1. Summary of Selected New Federal Estate and Gift Tax Provisions

Year	Estate and GST Tax Death-time Transfer Exemption	Gift Tax Exemption	Highest Estate & Gift Tax Rates[1]
2001	$675,000	$675,000	55%
2002	$1 million	$1 million	50%
2003	$1 million	$1 million	49%
2004	$1.5 million	$1 million	48%
2005	$1.5 million	$1 million	47%
2006	$2 million	$1 million	46%
2007	$2 million	$1 million	45%
2008	$2 million	$1 million	45%
2009	$3.5 million	$1 million	45%
2010	Estate and GST Tax repealed!	$1 million	Estate Tax repealed; Gift Tax top rate will equal the top individual rate of 35%
2011	Tax Reinstated! $1 million	$1 million	Back to the 2001 rules! 55%

1 The highest rate for decedent's estates over $3 million. For lifetime gifts, the rate kicks in for gifts over $500,000 in 2010.

Ag Economy 2002

What at the prospects for the agricultural economy in 2002? Attend an Outlook Meeting this fall sponsored throughout the state by the Purdue Cooperative Extension Service. County meetings begin the second week of September. Topics include grain and livestock prices and marketing strategies, the land value and cash rent outlook, prospects for changes in government policy, and much more. Check with your local Extension office for a meeting in, or near, your county.

The Value of Waiting to Invest in a Cooperative Hog Slaughter Plant

Adam Maung, recent PhD graduate and Ken Foster, Professor

Recently, pork producers in the U.S. have shown significant interest in cooperative investment in modest scale slaughter plants. By owning a share of a slaughter plant, hog farmers feel that they would have better control over marketing and production decisions and reap a higher return by retaining ownership of their animals further down the marketing channel. According to an estimate by National Pork Producer Council, producers get 29 cents for every dollar that consumers pay at a grocery (*Pork*, November 2000). By slaughtering and cutting, producers can add another seven cents to their pockets. The interest in producer-owned slaughter plants is further actuated by the lesson learned from the 1998 financial debacle in which the lack of slaughter capacity was widely believed to be one of the major culprits. Some hog farmers in the U.S feel that they can avoid such a dire financial consequence in the future by taking matters in their own hands. The anecdotal experience has already led some producers to begin implementing vertically integrated strategies. For example, a producer cooperative has gone as far as to break ground for a slaughter plant with 2,000 head daily-slaughter capacity in Decatur, Illinois (Briefs, August 2000, pp. 10). The plant is expected to open sometime this year.

To respond to the increased interest, the National Pork Producers Council (NPPC) contracted a private consulting firm to investigate the viability of modest-scale pork packing plants. In January 2001, NPPC members convened in Des Moines to discuss some of the preliminary findings. The study included detailed estimates of construction as well as operating costs of a 2,500 head daily slaughter plant and its financial feasibility. Based on a ten-year cash flow analysis, the consultants estimated a net present value (NPV) of $11.951 million for investment in a single-shift plant. A cash flow of twenty years, which most experts agree to be the useful life of the plant, makes the investment prospect even more attractive. This traditional capital budgeting method of NPV analysis clearly favored the investment.

A New Approach to Investment Analysis

In recent years, academic researchers have proposed a

modified approach toward an investment analysis under uncertainty and irreversibility. According to the new approach, there is a value associated with waiting to invest in a project with large sunk-cost and substantial uncertainty about future prospects. For example, if a firm invests now and faces an unanticipated declining output price or weakening demand, it will sustain losses that cannot be avoided due to the irreversible nature of the investment. The firm, on the other hand, can avoid such losses by waiting to invest until it observes a more favorable price or demand condition. Alternatively, if price does not recover the firm can postpone investment indefinitely, thus avoiding the loss and the cost of the investment. In other words, being able to postpone until a later date has economic value. Investing now incurs an opportunity cost namely the value of future flexibility or option. This additional cost should be accounted for in any sound investment analysis. In fact, accounting for such uncertainty is inherent in how we make decisions (both economic and otherwise) every day. We are constantly seeking further information when making decisions that cannot be reversed without a significant cost.

For example, people spend substantial amounts of time with prospective spouses before committing to marriage, companies participate in market testing before launching new products, and farmers seek information via research services before making large investments in new technologies. The list of examples where waiting is optimal behavior is very long.

The modified rule-of-thumb in investment analysis is that the net present value of cash flows from a project has to exceed the initial cost by the value of waiting. Under uncertainty and irreversibility, the size of the opportunity cost becomes intrinsic to capital budgeting.

The magnitude of the value of waiting largely depends on the volatility of the cash flow and the magnitude of the initial expenditure. It makes sense that it is better to postpone the investment under a volatile cash flow condition. On the other hand, a large initial investment cost leads to a large sunk-cost. Either case enhances the value of waiting. Pragmatically, one would not be greatly concerned about a small expenditure even if there were substantial volatility, but for any sized investment greater volatility means that the future has more information to be potentially revealed. Nevertheless, it is widely believed that the waiting value ranges from two to three times that of the initial expenditure. Obviously, this large opportunity cost can have a profound effect on the investment decision, and it can easily lead one to reject a project otherwise accepted under the traditional NPV method.

Investment in a Hog Slaughter Plant

Investment in a hog slaughter plant fits the conditions that underline the new approach to investment analysis. First, a hog slaughter plant has very little use outside the hog industry, a characteristic that makes the initial expenditure a sunk cost. Thus, the decision to invest in the plant is essentially irreversible or cannot be reversed without incurring substantial loss of equity. Second, the uncertainty in hog and pork prices is substantial. An additional uncertainty for a farmer cooperative are the strategic responses of existing slaughter facilities. They may choose to lower prices charged for wholesale pork and/or raise the prices, they pay for live hogs in an effort to force the producer group out of the slaughter business. Because uncertainty is great, a traditional NPV would lead to a sub-optimal over-investment.

The Value of Waiting

Given the inherent uncertainty in prices and the irreversible nature of investment in hog slaughter facilities, the option to postpone held by hog producers may inherently affect the decision to install a new facility. Knowledge of the value of the investment option is critical to hog producers who contemplate such a project. The following table shows the estimated value of waiting along with the estimated NPV for investments in single-shift 2,500 and 1,000 head daily slaughter capacity plants with expected lives of 20 years.

The study assumes uncertainty in prices of live hog, wholesale pork, corn, and soybean meal and includes the collective investment and returns of all cooperative members from raising hogs, slaughtering hogs, and marketing wholesale pork. The first column of the table shows the initial prices used in the simulation. Under a traditional analysis, both the projects will be accepted because of the positive NPVs, which range from 30.45 to 34.82 million dollars, and from 11.08 to 13.76 million dollars, respectively, for the 2,500 and 1,000 head daily slaughter capacity plants. The table, however, tells a different story if uncertainty and irreversibility are accounted for. The value of waiting, which ranges from 97.33 to 98.75 million dollars, and from 39.12 to 40.01 million dollars, respectively, for the 2,500 and 1,000 head plants, far exceeds the NPV. According to the modified rule, which interprets the value of waiting, as the cost of investing now, both projects will be rejected under all of the initial price scenarios. The option to postpone or the value of waiting unambiguously overrides the traditional NPV prescription.

Traditional capital budgeting methods, such as NPV and internal rate of return, have been employed to assist these decision makers. Traditional NPVs estimated both in an NPPC study and in this paper suggest making immediate investments in either of two modest sized packing plants. Although the traditional NPV would suggest a clear-cut immediate investment, the new approach that accounts for the uncertainty inherent in the pork industry and the irreversibility of such a large investment indicates otherwise. The seemingly large value associated with waiting in both cases suggests that producers should adopt a "wait and see" attitude. This is particularly true since we did not include any of the uncertainty associated with strategic behavior on the part of existing pork slaughter firms.

"Hog producers in the U.S. are in the exploratory stages of gathering information to study the financial viability of vertically integrating into hog slaughter and processing."

Conclusion

Hog producers in the U.S. are in the exploratory stages of gathering information to study the financial viability of vertically integrating into hog slaughter and processing.

Estimated Investment Option Values (million dollars) for the Cooperative

Initial Prices[1]	2,500 Head Daily Slaughtered		1,000 Head Daily Slaughtered	
	Value of Waiting [Conf. Int.]	NPV [Std. Dev.]	Value of Waiting [Conf. Int.]	NPV [Std. Dev.]
(42, 106.4, 1.7, 170)	97.78	34.82	40.01	11.08
	[77.81,116.54]	[11.49]	[32.1,47.01]	[3.05]
(47,106.4, 1.7, 170)	98.23	31.24	39.69	11.51
	[79.56,115.79]	[9.95]	[31.95,46.86]	[3.12]
(42, 120, 1.7, 170)	98.23	31.159	39.52	11.9
	[79.13,116.25]	[9.521]	[32.09,46.51]	[3.48]
(42, 106.4, 2.7, 170)	97.33	34.11	39.22	13.76
	[75.05,116.95]	[10.04]	[31.09,46.74]	[3.19]
(42, 106.4, 1.7, 210)	98.75	30.45	39.12	13.01
	[80.16,116.39]	[8.63]	[31.24,46.37]	[3.72]

1 Initial Prices = (Live Hog Price ($/cwt.), Wholesale Pork Price ($/cwt.), Corn Price ($/bushel), Soybean Meal Price ($/ton))

Crop and Revenue Insurance Alternatives

Kurt J. Collins, research analyst with Sparks Companies, Inc.; James G. Pritchett, recently on the faculty at Purdue, is now an Assistant Professor, Department of Agricultural and Resource Economics, Colorado State University; and George F. Patrick, Professor*

Risk is pervasive and important in agriculture – highly variable commodity prices, uncertain yields, and changing government programs all contribute to a risky business environment. Crop producers can address business risk with a variety of risk management tools. For example, pre-harvest pricing, whether it be with cash forward contracts, options, or futures hedges, can protect against declining prices often associated with harvest. Yield insurance (e.g., actual production history or APH) compensates for low yields, and the newer revenue insurances (e.g. Crop Revenue Coverage or CRC) trigger compensation when prices and/or yields are low. Finding a risk management tool is not particularly difficult; rather, choosing a tool or combination of tools that best fits an individual's risk situation is challenging.

This article provides an overview of the crop and revenue insurance products available for corn and soybean producers in Indiana.** A number of crop insurance products have evolved over time, and the following sections describe the basic types offered: yield insurance, revenue insurance and group insurance. Examples illustrate the basics of coverage for several insurance types. Table 1 summarizes the estimated 2001 producer premiums costs for available levels of coverage for corn. Although not discussed, similar information for soybeans is presented in Table 2. Another article will examine the interaction of crop and revenue insurance with forward marketing.

Yield Insurance

Actual production history (APH) insurance is the oldest form of multiple peril crop insurance subsidized by the Federal Crop Insurance Corporation (FCIC), and is sometimes referred to as MPCI. Under APH insurance, producers can elect yield coverage levels from 55% to 85% of their APH yield. The APH yield is based on a producer's records for at least 4 years and can include up to 10 years. If actual yields drop below the guarantee level (say 75% of the APH yield), insurance indemnity payments equal the yield shortfall times the FCIC price. The FCIC price is an expected harvest price that is determined before crops are planted—at the beginning of the calendar year for corn and soybeans.*** The FCIC price, rather than actual or futures market prices, is used to calculate premiums and indemnities for APH insurance. Unlike some of the types of insurance to be discussed later, APH does not protect against a decline in the price of the commodity. To better understand the protection offered by APH insurance, see the example below.

APH premiums are based on the county in which the crop is located, the APH yield, the FCIC price, and the yield election. As would be expected, premiums are higher for

Table 1. Estimated 2001 Producer Premiums per Acre of Corn for Alternative Crop Insurance Policies, Carroll County, Indiana.

Coverage level (%)	APH[1]	CRC[2]	IP[3]	RA[4] Base Price Option	RA[4] Harvest Price Option	GRP[5]	GRIP[6]
50	1.06	1.67	0.74	NA	NA	NA	NA
55	1.38	2.23	0.96	NA	NA	NA	NA
60	1.68	2.76	1.21	NA	NA	NA	NA
65	2.36	3.93	1.69	2.22	3.35	NA	NA
70	3.09	5.14	2.13	3.51	5.07	0.79	0.81
75	4.60	7.63	3.14	5.56	7.79	1.01	1.50
80	7.20	11.89	NA	8.75	12.00	1.54	3.15
85	11.49	18.92	NA	13.67	18.41	2.70	5.19
90	NA	NA	NA	NA	NA	4.79	8.67

1 APH yield of 144 bu/ac and 100% of the $2.05 FCIC price election. Note that premiums are proportional to price. If a $2.46 price election had been available, premiums would be 20% higher.

2 APH yield of 144 bu/ac and $2.46 price.

3 Average yield of 144 bu/ac, $2.46 price and production 1991-2000, from RMA website premium calculator. Note that IGF Insurance quotes are lower (e.g. $0.70 for 50% and $2.99 for 75%).

4 APH yield of 144 bu/ac and $2.46 price election. Base and harvest price options premiums are calculated from IGF Insurance website www.webquote.igfinsurance.com. P2-60% prevented planting option and 1 section assumed.

5 Assumes $313.39 of coverage (152.875 bu/ac expected yield times $2.05 FCIC price) Note that premiums are proportional to price assumed. A $2.46 price would increase premium by 20% or to $5.75 for 90% level.

6 Assumes $374.85 of coverage (152.875 bu/ac expected yield time $2.46 price).

** This research was completed while Collins was a graduate student research assistant at Purdue University.*

*** Discussion of the units that can be insured (e.g. basic, optional, whole farm) is omitted from the text. Some insurance types may not be available for all units, readers are encouraged to contact their risk management professional for details.*

**** Producers can elect to cover 60% to 100% of the FCIC price. Unless otherwise stated, these examples use a 100% price election.*

higher prices and higher yield elections. Typically, there is little difference in premiums by APH yield levels within a county.

Catastrophic Risk Protection (CAT) is a minimum level of yield coverage available. The CAT yield guarantee is 50% of the APH yield, while the payment rate is established at 55% of the FCIC price. CAT insurance protects approximately one-third of expected harvest revenue, and the insurance premium for CAT coverage is entirely subsidized by the government. However, the producer must pay a $100 administrative fee for each crop covered in a county.

Clearly, yield insurance can provide some risk protection for producers. APH insurance provides higher guaranteed yields and uses a higher percentage of the FCIC expected price than CAT insurance. Low yields may trigger an indemnity payment with CAT and APH, but no protection is offered when prices are low. In contrast, revenue insurances may provide risk protection when either prices and/or yields are low.

Revenue Insurances

Crop Revenue Coverage (CRC), Income Protection (IP), and Revenue Assurance (RA) are basic types of revenue insurance that are available in Indiana. In general, revenue insurances protect the insured producers against low yields and/or declines in prices. Producers may choose to protect a portion of their APH yield – just like with yield insurance – and the prices guaranteed based upon the specific provisions of each insurance policy. In all revenue insurances, Chicago Board of Trade (CBOT) futures prices, not the actual prices received by an individual producer, are used for insurance purposes. Thus, revenue insurance does not protect producers against poor marketing in their local cash markets or against chronically low commodity prices.

**** *Rates are quoted for 2001 using the Risk Management Agency's on-line premium calculator http://www.rma.usda.gov/tools/.*

Table 2. Estimated 2001 Producer Premiums per Acre of Soybeans for Alternative Crop Insurance Policies, Carroll County, Indiana.

Coverage level (%)	APH[7]	CRC[8]	IP[9]	RA[10] Base Price Option	RA[10] Harvest Price Option	GRP[11]	GRIP[12]
50	0.74	0.95	0.44	NA	NA	NA	NA
55	0.96	1.26	0.57	NA	NA	NA	NA
60	1.17	1.57	0.73	NA	NA	NA	NA
65	1.65	2.24	1.03	1.30	1.83	NA	NA
70	2.16	2.92	1.31	2.17	3.01	0.69	0.59
75	3.22	4.32	1.95	3.51	4.80	0.79	0.69
80	5.03	6.73	NA	5.57	7.50	1.01	1.33
85	8.05	10.73	NA	8.72	11.55	1.68	2.41
90	NA	NA	NA	NA	NA	3.08	4.38

7 APH yield of 49 bu/ac and 100% of the $5.26 FCIC price election.

8 APH yield of 49 bu/ac and price of $4.67.

9 Average yield of 49 bu/ac, $4.67 price and production 1991-2000 from RMA website calculator. Note that IGF Insurance quotes are slightly lower (e.g. $0.42 for 50% coverage and $1.85 for 75% coverage).

10 APH yield of 49 bu/ac and $4.67 price election. Base and harvest price options premiums are calculated from IGF Insurance website www.webquote.igfinsurance.com. P2-60% prevented planting option and 1 section assumed.

11 Assumes $273.52/ac of coverage (52 bu/ac expected yield times $5.26 FCIC projected price). Premiums are proportional to coverage level (e.g., coverage at the $4.76 CRC price would result premium about 88.8% of those in the table).

12 Assumes $273.52/ac of coverage (52 bu/ac expected yield time $5.26 FCIC projected price). Premiums are proportional to coverage level (e.g., coverage at the CRC price of $4.76 would result in premium about 88.8% of those in the table).

APH Example:

Consider a Central Indiana farm that produces corn with a proven APH yield of 144 bushels per acre. The producer chooses a 75% coverage level, so indemnity payments are triggered when the harvested yield falls below 108 bushels per acre. Given the published FCIC price of $2.05 per bushel for 2001, the level of protection for this producer is then:

Formula: APH Yield * % Coverage Level * FCIC Price = Level of Protection per acre.

Example: 144 bu/ac * 75% * $2.05 per bu = $221.40 per acre

In 2001, the APH policy used above would have cost roughly $4.60 per acre for a basic unit.****

CAT vs. APH Insurance

In the previous example, purchasing APH insurance with a 75% coverage provided a level of protection of $221.40 per acre at a cost of $4.60 per acre. The level of protection provided by CAT is:

(144 bushels * 50%) * ($2.05 * 55%) = $81.18 per acre

where 144 bushels is the APH yield and $2.05 is the FCIC estimated harvest price. The total cost of this insurance is $100. If a producer has 500 acres of corn, the cost would be $0.20 per acre.

Table 3. Thousands of Acres Insured and Percent of Insured Acres by Type of Insurance, Indiana, 2000.

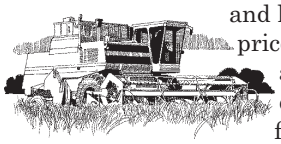
	Corn		Soybeans	
Type of Insurance	1,000 acres insured	% of insured acres	1,000 acres insured	% of insured acres
CAT	422.0	12.4	591.3	18.4
APH	527.4	15.5	656.6	20.5
CRC	1,822.3	53.6	1,396.9	43.5
IP	68.0	2.0	67.1	2.1
RA	89.8	2.6	49.4	1.5
GRP	315.4	9.3	334.5	10.4
GRIP	157.9	4.6	112.3	3.5
TOTAL	3,402.8	100.0	3,208.1	100.0

Source: http:/www3.rma.usda.gov/apps/sob/cropstate.cmf

Crop Revenue Coverage (CRC)

As Table 3 indicates, popular type of revenue insurance is Crop Revenue Coverage (CRC).Yield protection is based on the producer's APH yield, while price protection is established using the higher of a ***base*** or ***harvest*** price. The ***base*** price for corn is the average of the daily closing CBOT futures prices for the December corn contract during the month of February. The ***harvest*** price is the average closing price of the December corn contract during November. Using the higher of the base or harvest prices allows producers to protect the higher value of the crop, whether it is in spring or fall. Recall that the price guarantee with APH insurance is the FCIC established price, which is an expected harvest price fixed prior to planting of the crop. The CRC base or harvest price option gives more flexibility in protection than APH.

Similar to corn, the soybean base and harvest prices are averages of daily CBOT futures closing prices for the November soybean contract in February and October, respectively. The limits on the allowable price increases between the base and harvest prices are $1.50 for corn and $3.00 for soybeans.



The producer may choose a coverage level between 50% and 75% (85% in selected counties) of their APH yield. The final revenue guarantee is established by multiplying the APH coverage level times the higher of the base price or harvest price. An indemnity payment occurs when the revenue resulting from the producer's yield times the harvest price is less than the CRC final revenue guarantee. Therefore, indemnities are not paid until the actual production and CBOT harvest prices are determined. CRC premiums tend to be significantly higher than APH premiums for the same percentage coverage level.

The advantage of CRC insurance is two-fold. First, it provides a revenue guarantee for a situation in which yields are high, but prices are low. If yields are high, APH insurance does not protect against low revenues because of low prices. Second, CRC insurance allows for the revenue guarantee to capture the higher value of the crop in two time periods, spring or harvest. This is particularly valuable when prices increase during the growing season, perhaps due to drought, and the harvested crop is more valuable than it was expected to be prior to planting.

CRC Example

Returning to our Central Indiana farm, we can calculate the basic protection of CRC at a 75% coverage level. For the first part of the example, suppose the spring price is $2.46 per bushels (computed as the average of CBOT December futures contract price closes in February). The revenue guarantee using the base price is:

(base price) 144 bu/ac * 75% coverage * $2.46 per bushel = $265.68 per acre

In 2001, the estimated premium for this insurance is $7.63 per acre.

If the harvest price (computed as the average of the CBOT December futures contract price closes in November) is greater than $2.46 per bushel, this harvest price is used in lieu of the spring price. Suppose the harvest price is $2.56. Then the per acre revenue guarantee is computed as:

(harvest price) 144 bu/ac * 75% coverage * $2.56 per bushel = $276.48 per acre.

Income Protection (IP)

Income Protection (IP) insurance compensates producers when prices and/or yields are low, resulting in gross incomes below the guarantee level. The IP income guarantee is calculated by multiplying the APH yield by the chosen coverage level and the projected price. The projected harvest price is determined in the spring and, similar to the CRC program, is based on the CBOT futures prices. Indemnity payments are calculated as the difference between the income guarantee and the harvest income (harvest price times harvest yield). But unlike CRC, the IP income guarantee level does not include a harvest price option. Thus, IP does not adjust the income guarantee level if prices rise between spring and fall. In addition, the IP insurance unit includes all the acreage of an insured crop in the county in which an insured producer has an interest.

Because the IP income guarantee does not increase if prices rise

between spring and fall, IP insurance premiums tend to be lower than CRC premiums. Furthermore, in major production areas such as Indiana, low yields of corn and soybeans tend to be associated with high corn and soybean prices. This low yield/high price relationship, called the "natural hedge," tends to stabilize income even when yields are low. Because of this natural hedge, IP indemnity payments will tend to be made less frequently than APH indemnities in much of Indiana. As a result, IP premiums are often less than APH premiums. For our example Central Indiana farm, the IP premium for the 75% coverage level for 2001 was $3.14 per acre compared with $4.60 for APH and $7.63 for CRC.

Revenue Assurance (RA)

Revenue Assurance (RA) provides a revenue guarantee that is calculated by multiplying the APH yield by the coverage level and the projected harvest price. Indemnities are paid when the harvest yield times the harvest price is less than the revenue guarantee.

There are two price options under the RA insurance, RA-Base Price and RA-Harvest Price. RA-Base Price calculates the revenue guarantee prior to the sign-up deadline (March 15 for corn and soybeans), and functions similar to the IP insurance program. RA-Harvest Price also determines the base revenue guarantee prior to the sign up deadline; however, the guarantee may increase if prices increase between the sign-up date and harvest. Thus, the RA-Harvest Price option is similar to CRC, except there are no limits on the price increases that can occur.

For our example Central Indiana farm, the RA-Base Price option premium for the 75% coverage level for 2001 was $5.56 per acre. This is higher than the $3.14 IP premium, largely because of the differences in the insurance unit. The Harvest Price option premium for the 75% level was $7.79, almost the same as the $7.63 for similar CRC insurance.

Group Insurance Plans

The previous yield and revenue insurance plans protect revenue when an individual producer's yields are low. In contrast, group insurance plans are based on what happens in the county rather than the experience of an individual producer. With a group insurance plan, a producer may suffer a substantial loss, but unless the county suffers a loss, no indemnity would be paid. The risk protection provided by group insurance plans are suited for producers whose yields track county yields, especially in bad years. However, only limited risk protection is provided by group insurance plans if a producer has major losses in years when the county has only small losses.

Group Risk Plan (GRP)

The Group Risk Plan (GRP) provides indemnity payments when the county's actual yield is below the trigger yield. The trigger yield is chosen by the producer at insurance sign up, and generally ranges between 70% and 90% of the expected county yield. The expected county yield is based on the county's yield history, extending back to 1962, and incorporates the yield trend. In our Central Indiana county, the expected 2001 yield for corn is almost 153 bushels/acre, somewhat higher than the 144 bushels per acre APH yield of a producer whose yields were equal to the county average yield.

If the county yield is below the trigger yield, the percentage yield shortfall is computed. Indemnity payments then equal the percent yield shortfall times the protection level selected by a producer. The maximum protection level represents the revenue associated with a yield 1.5 times the expected county's yield times the FCIC price. A producer can insure from 60% to 100% of that maximum county protection level. For our example farm, insuring the 153 bushel expected yield at the $2.05 FCIC price would provide about $313 of revenue per acre. At the 90% trigger yield level, indemnities would begin to be paid if the county yield dropped below about 138 bushels per acre.

GRP is a countywide version of APH. Because GRP indemnities are triggered by a county crop failure rather than an individual farm failure, these indemnities occur

GRP Example:

Consider a Central Indiana farm with an expected county yield of 153 bushels per acre. If the producer chooses a 90% trigger yield, an indemnity payment would be triggered if the county yield was less than 138 bushels per acre. Given the expected harvest price of $2.46, the level of protection would be 153 bu/ac * $2.46 = $376.38 per acre. The yield guarantee is

Formula: Expected county yield * Trigger Level = Yield Guarantee

Example: 153 bu/ac * 90% = 138 bushel/acre yield guarantee

If actual county yields were only 120 bushels per acre, there is a 18 bushel shortfall. The percentage yield shortfall is:

(138 bu/ac yield guarantee – 120 bu yield) / 138 bu/ac yield = 13.04% yield shortfall

Indemnity: 13.04% yield shortfall * $376.38 level of protection = $49.09 per acre indemnity.

much less frequently than APH indemnity payments. It follows then that the GRP premiums would be less than the APH premiums for a given coverage level. At the 75% level, the 2001 GRP premium was $1.01 per acre as compared with $4.60 for APH.

averages of the November soybean and December corn futures prices in October and November, respectively.

County income equals the harvest price times the actual county yield. The actual yield is calculated and released in March of the year after the crop is harvested. Indemnity payments occur when the county income is below the income guarantee. The payment equals the percentage revenue shortfall times the protection level selected. The producer chooses the protection level from a range of 60% to 100% of the maximum protection per acre. As with GRP, the maximum protection level is 150% of the expected county yield.

"Indiana producers have a variety of choices regarding crop and revenue insurance."

Because GRP is based on county yields, payment of indemnities is delayed until the USDA National Agricultural Statistics Service (NASS) determines county yields. Usually county yield information is available in March of the year following harvest.

Group Risk Income Plan (GRIP)

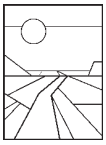
The Group Risk Income Plan (GRIP) insures income (rather than yields) based on the county's yield and the expected harvest price. The expected price is calculated somewhat differently from other revenue-based insurances. GRIP averages the settlement CBOT futures prices for the last five business days preceding the March 15 sign-up. The December CBOT corn futures and the November CBOT soybean futures settlement prices are used for the expected price calculations. Harvest prices are calculated using the

For the example county, insuring the 153 bushel expected county yield at $2.46 per bushel (price used for revenue insurance) would give a revenue coverage of about $375 per acre. The 2001 premiums would have been $1.50 and $8.67 for the 75% and 90% levels of coverage, respectively.

Summary

Indiana producers have a variety of choices regarding crop and revenue insurance. This article presents an overview of the various products, the type of protection they provide and some information on estimated premium costs. For some insurance products, the coverage is based on what happens to the individual insured producer. CAT and APH provide protection only against yield losses. In contrast, some types of insurance provide protection when revenues are low (CRC, IP, RA). It is important for producers to understand the differences in how the revenue guarantees are determined. In all cases, the price used for insurance purposes is not based on a local market price. Thus, the insurance will not protect producers from poor marketing decisions. Other insurance products have coverage based on what happens at the county level. A producer may suffer a major loss, but if the county is largely unaffected, he or she will not receive an insurance indemnity under GRP or GRIP.

Crop and revenue insurances are only some of the risk management responses available to producers. No one response is suitable for all producers. Marketing and financial responses to risk may also be part of an individual producer's risk management strategy. A producer's willingness to assume risk and his or her ability to bear risk will also affect his or her risk management strategy.



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