

PURDUE AGRICULTURAL ECONOMICS REPORT

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How to Make More Money and Reduce Variability!

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Many corn and soybean producers in Indiana hesitate to price their crop before harvest because of concerns about not being able to fulfill their contract. Some producers do not buy crop insurance because they feel they have never had a loss large enough to collect an indemnity. Typically, risk management strategies involve giving up some potential return to reduce variability, especially to protect against low returns. However, Indiana producers who do not forward price their crops and carry crop insurance appear to be missing out on the opportunity for both higher average net revenues and lower downside risks.

A recent study analyzed pre-harvest pricing and insurance alternatives for a farm with a corn and soybean rotation in three geographical areas. Three counties were chosen: Elkhart County in Northern Indiana; Carroll County, in Central Indiana; and Posey County, in Southwest Indiana. The strategies which provided the highest net farm revenues and greatest downside protection (highest 5% VaR value) were identified for each county. Marketing strategies and crop insurance strategies were considered separately, and in combinations. A number of strategies both

increased average returns and decreased downside risk relative to the benchmark strategy of cash sale at harvest and no insurance during the period analyzed.

Overview of the Model

The example farms were “typical” farms of 1,500 acres in a 50/50 corn/soybean rotation. Prices for the 1986 to 2001 period were measured in real 2001 dollars and yields assumed 2001 technology levels. To reflect the current farm policy legislation, the 2002-03 loan rates and target prices were used. Crop insurance premiums and subsidies reflected the 2002-03 period. To represent how a farm’s net revenue can change under various growing and price conditions, a year between 1986 and 2001 was selected at random. The chosen year’s prices were used in revenue calculations with the farm’s corn and soybean yields based on deviations from the average farm level yields for that year. This simulation process was repeated 1,000 times leading to many possible potential new revenue outcomes under alternative risk management strategies.*

Risk Management Strategies

Mechanical marketing strategies, crop yield and crop revenue insurance, and combinations of marketing strategies and crop insurance were the risk management strategies considered.

Mechanical marketing strategies involved selling specified quantities of expected production on specific dates with no adjustments for market conditions. Strategies considered included cash sale at harvest, cash forward contracts, hedging with futures contracts, and hedging with put option contracts. Marketing strategies were implemented at 33%, 66%, and 100% of the estimated ten year moving average Actual Production History (APH) yields. APH and Group Risk Plan (GRP) were crop yield insurance products included. The crop revenue insurance products included in the analysis were Crop Revenue Coverage (CRC), Revenue Assurance (RA), Income Protection Plan (IPP) and Group Risk Income Protection (GRIP). Alternative crop and revenue insurances were analyzed at different coverage levels and price

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* For further details of the simulation model, see Rios or Collins et al. (2001b).

elections.** Combinations of marketing strategies and crop insurance coverage (synthetic revenue insurance) were evaluated to determine whether it would be less expensive and/or more effective to combine strategies rather than using the crop revenue insurance products available. The 74 risk management strategies considered in the analysis is presented in Table 1 with their identifying abbreviations.

Strategy Evaluation

Revenue was based on farm level production and harvest prices, LDPs and CCPs, gains or losses from marketing strategies, and insurance indemnity payments. We did not explicitly consider costs of production and direct government payments in the calculation of net farm revenue. We assumed that these costs and

payments were constant across strategies. Therefore, net farm revenue was determined by gross revenue less variable costs of risk management (premiums, commissions, and interest) for each strategy. The benchmark for risk management strategy evaluation was a no insurance, cash sale at harvest strategy.

Risk management strategies are compared using two criteria: average net revenue and downside risk (the possibility of a disaster). Producers would be expected to prefer strategies which have higher average net revenue to lower average net revenue. Downside risk is measured by the dollar amount of net revenue received in the worst year out of 20, a disaster

** For further information on crop and revenue insurance, see Collins et al. (2001a).

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Table 1. Risk management strategies

Risk Management Strategies		
Marketing Strategies	Abbreviation ¹	% of Expected Production
Harvest Cash Sale	Cash	
Short Futures Hedge (March 15)	Futures(M15)	33%, 66%, 100%
Short Futures Hedge (June 1)	Futures(J1)	33%, 66%, 100%
Forward Contract (March 15)	Forward(M15)	33%, 66%, 100%
Forward Contract (June 1)	Forward(J1)	33%, 66%, 100%
Long Put Options Hedge (March 15)	Put(M15)	33%, 66%, 100%
Yield Insurance Strategies	Abbreviation ²	Coverage Level
Catastrophic Risk Protection	CAT	50%
Actual Production History (100% Price Election)	APH(100%PE)	65%, 75%, 85%
Group Risk Plan (70% Maximum Protection)	GRP(70%MP)	70%, 80%, 90%
Group Risk Plan (100% Maximum Protection)	GRP(100%MP)	70%, 80%, 90%
Revenue Insurance Strategies	Abbreviation ²	Coverage Level
Crop Revenue Coverage	CRC	65%, 75%, 85%
Income Protection	IP	65%, 75%, 85%
Revenue Assurance-Base Price	RA-BP	65%, 75%, 85%
Revenue Assurance-Harvest Price	RA-HP	65%, 75%, 85%
Group Risk Income Protection (70% Max. Protection)	GRIP(70%MP)	70%, 80%, 90%
Group Risk Income Protection (100% Max. Protection)	GRIP(100%MP)	70%, 80%, 90%
Combination Strategies	Abbreviation ²	Insurance Coverage Level
APH (100% price election) & 66% Expected Production Short Futures Hedge (March 15)	APH(100%PE) Futures(M15)66%	65%, 75%, 85%
APH (100% price election) Corn Only & 66% Expected Production Short Futures Hedge Corn & Soybeans (March 15)	APH(100%PE) CFutures(M15)66%	65%, 75%, 85%
GRP (70% max protection) & 66% Expected Production Short Futures Hedge (March 15)	GRP(70%MP) Futures(M15)66%	70%, 80%, 90%
GRP (100% max protection) & 66% Expected Production Short Futures Hedge (June 1)	GRP(100%MP) Futures(J1)66%	70%, 80%, 90%
APH (100% price election) & 66% Expected Production Forward Contract (March 15)	APH(100%PE) Forward(M15)66%	65%, 75%, 85%
APH (100% price election) & 66% Expected Production Forward Contract (June 1)	APH(100%PE) Forward(J1)66%	65%, 75%, 85%
GRP (100% max protection) & 66% Expected Production Forward Contract (March 15)	GRP(100%MP) Forward(M15)66%	70%, 80%, 90%
GRP (100% max protection) Corn Only & CRC Soybeans Only	GRP(100%MP) CRC	70%, 80%, 90% 65%, 75%, 85%
APH (100% price election) & 66% Expected Production Put Option Hedge (March 15)	APH(100%PE) Put(M15)66%	65%, 75%, 85%
GRP (70% max protection) & 66% Expected Production Put Option Hedge (March 15)	GRP(70%MP) Put(M15)66%	70%, 80%, 90%

¹ Marketing strategies are referred to using the abbreviation followed by percentage of expected production hedged or forward contracted.

² Strategies involving insurance alternatives are referred to using the abbreviation followed by insurance coverage level.

year. This is referred to as the 5% Value-at-Risk (VaR) and there is a 5% chance that net revenue would be less than that amount. Therefore, risk averse producers would prefer strategies with higher values of 5% VaR over strategies with lower 5% VaR, if the strategies have similar net revenues.

Results

Table 2 shows the dollar amount of average net revenue per acre and 5% VaR for the benchmark strategy of cash sale at harvest with no insurance in each county. Carroll County had the highest average revenue, \$352 per acre, reflecting the higher yield levels as compared with Elkhart and Posey Counties. Elkhart County's 5% VaR of \$152 per acre was the lowest in both absolute and relative terms at 54.2% of the average revenue. For comparisons among strategies, the average net revenue and 5% VaR are presented as a percentage of the benchmark (no insurance, cash sale at harvest) strategy in each county. Thus, strategies with values that exceed 100 out performed the benchmark strategy on that criterion.

Strategies with Highest Average Revenue

Figure 1 presents the risk management strategy with the highest average net revenue and its corresponding 5% VaR as percentages of the benchmark strategy in each county. In Elkhart County, the strategy with the highest net revenue, about 111% of the benchmark, came from forward pricing all expected production on March 15 using futures. The highest average net revenue in Carroll County also involved selling 100% of expected production on March 15 using futures while Posey County used put options. The 5% VaRs for these strategies range from about 106% of the benchmark strategy in Posey County to about 117% in Elkhart County. In all three counties, the strategy with highest average net revenue involved marketing strategies, and provided both higher average net revenue and lower downside risk than the benchmark of cash sale at harvest with no insurance.

Table 2. Average net revenue and 5% VaR of cash sale at harvest, no insurance strategy

County	Average Net Revenue (\$/acre)	5% VaR (\$/acre)
Elkhart	281.37	152.42
Carroll	352.46	220.38
Posey	274.30	197.57

Strategies with Highest VaR

For producers primarily concerned about downside risk, the possibility of a disaster, Figure 2 presents the strategy in each county with the highest net revenue in the worst year out of 20. These 5% VaR values and their corresponding average net revenues were also presented as percentages of the benchmark strategy. In all three counties, strategies with the highest 5% VaRs involved crop insurance. These strategies provided a substantial increase in the 5% VaR, while also providing slightly higher average net revenue than the benchmark strategy. In Elkhart County, CRC at 85% coverage level provided more than 40% increase in downside risk protection and similar average net revenue to the cash sale at harvest, no insurance strategy. Thus, producers in all these counties improved their downside risk protection without sacrificing average returns.

Using Marketing Strategies

Figure 3 shows the average net revenue and 5% VaR associated with different levels of cash forward contracts, as a percentage of expected production, established in March and June in Carroll County. In general, forward contracting in March resulted in a higher average net revenue and less downside risk than June forward contracting. Producers got a higher average return and better downside protection by pricing on March 15 rather than June 15. This was consistent with the Wisner et al. analysis of income increasing pre-harvest marketing strategies. However, pricing a higher proportion of expected crop reduced the downside risk protection, 5% VaR values were lower. As a higher percentage of the crop is committed, the probability of having a crop shortfall and having to purchase grain to meet the contract commitment increased. Compared to cash sale at harvest, forward contracting in March resulted in higher

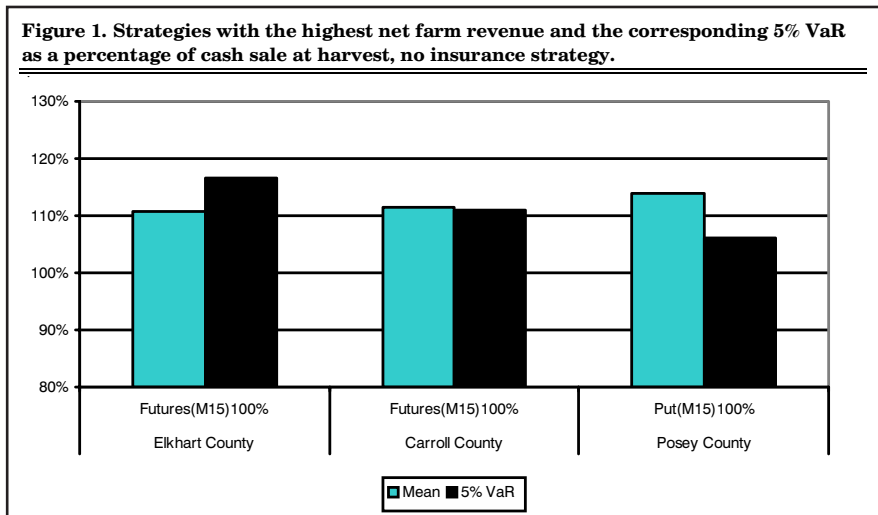
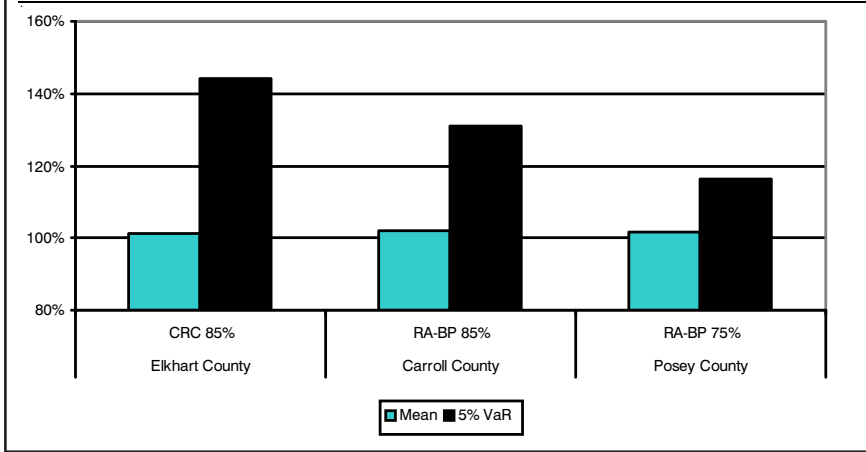


Figure 2. Strategies with the highest 5% VaR and the corresponding net farm revenue as a percentage of cash sale at harvest, no insurance strategy.



average net revenue, but generally greater downside risk. Forward contracts established in June provided both lower average net revenue and lower downside protection than the benchmark strategy of cash sale at harvest with no insurance. This is the type of strategy which producers will want to avoid.

Crop Insurance

Average net farm revenue and 5% VaR of some crop insurance strategies in Elkhart, Carroll and Posey Counties are presented in Table 3. Compared to cash sale at harvest, there were crop insurance strategies, such as APH and CRC in Elkhart

and Carroll Counties that provided slightly higher mean net farm revenues, but substantially increased protection against downside risk. In contrast, the APH and CRC insurance strategies in Posey County had slightly lower mean net revenues and the downside protection provided was less than the cash sale at harvest with no insurance strategy. In part, this may be due to per bushel premium rates in Posey County that were nearly double those of the other counties analyzed.

Average net farm revenues and 5% VaRs for some GRP insurance strategies are also presented in Table 3. The net farm revenues

associated with the GRP insurance was essentially the same as that of the cash sale at harvest, no insurance strategy. GRP slightly increased the 5% VaR for Carroll County, but had no effect in Elkhart County. In Posey County, the 5% VaR was slightly reduced relative to the benchmark strategy. These results suggest producers in Posey County may need to evaluate the risk management aspects of crop insurances as single strategies more carefully than producers in Elkhart and Carroll Counties.

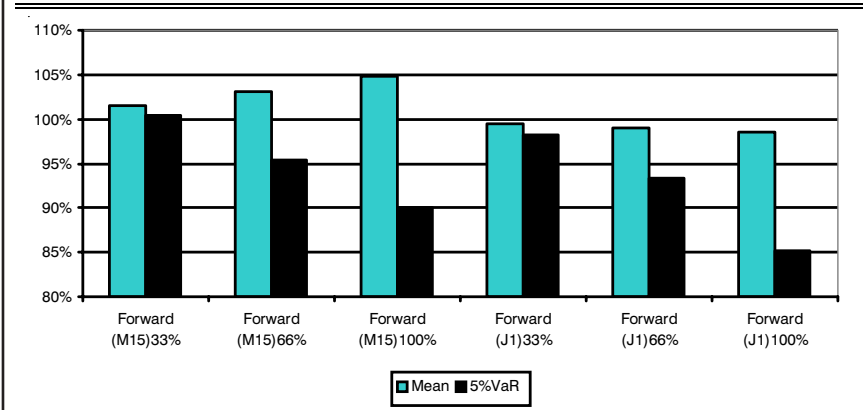
Effects of Combining Strategies

Producers can combine pre-harvest pricing with crop insurance and have a form of synthetic revenue insurance. Average net farm revenue and 5% VaR of CRC and some combinations of pricing and insurance strategies are presented in Table 4 for Elkhart, Carroll, and Posey Counties. All of the strategies presented provided both higher average net revenues, with the exception of CRC in Posey County, and lower downside risk than the benchmark strategies of cash sale at harvest with no insurance. The improvement in downside protection was greatest in Elkhart County, the county with the largest downside risk. The improvement ranged from 113% to 141% of the cash sale at harvest, no insurance strategy.

The improvement in downside protection was generally greater than the increase in average net revenue in all three counties. For example, APH at 100% price election and 75% coverage level combined with futures contracts established in March provided a 9% to more than 30% increase in downside risk protection but less than 10% increase in average revenue. It is unusual that risk management can provide both greater downside protection and higher average returns.

The performance of GRP in conjunction with the use of futures contracts presented a contrast to GRP as a stand-alone risk management strategy. Both average net farm revenues and 5% VaRs of GRP were higher than CRC in all three counties.

Figure 3. Carroll County: mean net farm revenue and 5% VaR of March vs. June marketing strategies as a percentage of cash sale at harvest with no insurance.



In contrast to the northern counties, GRP with pre-harvest futures or puts provided higher average revenue than APH and futures in Posey County.

The dollar amount of the increases in average net revenue ranged from about \$22 per acre in Elkhart County to over \$27 per acre in Carroll and Posey Counties. Increases in net revenues in a disaster year, the 5% VaRs, ranged from about \$27 per acre in Posey County to over \$62 per acre in Elkhart County.

Summary and Conclusions

Risk management typically involves giving up some income to reduce variability, especially downside variability. Results of this study, which considered the 1986-2001 period, suggest that producers could have gotten both higher average net revenue and less downside risk. The magnitudes of the potential improvements were substantial, \$22 to \$27 per acre or \$33,000 to \$40,500 on a 1,500 acre farm similar to those analyzed.

Early forward contracting (March 15) resulted in higher average net revenues and higher 5% VaR values (less downside risk) than late forward contracting (June 15). In some counties, late forward contracting resulted in lower average net revenue than selling at harvest. In general, contracting a higher proportion of expected crop increased both average net revenue and downside risk.

Some of the crop insurance products analyzed may provide both higher average net revenue and lower downside risk than cash sale at harvest with no insurance. Increases in average net revenue were generally small and resulted from the crop insurance premium subsidies.

Combining marketing strategies with crop insurance to produce a form of synthetic revenue insurance improved both average net revenues and 5% VaRs in all three counties. These synthetic revenue insurances generally outperformed CRC, but do require greater management as producers must be concerned with both crop insurance and marketing strategies. The effects of risk

Table 3. Average net farm revenue and 5% VaR (in parentheses) of selected crop/revenue insurance strategies as a percentage of the cash sale at harvest, no insurance strategy in Elkhart, Carroll, and Posey Counties.

Risk Management Strategy	Elkhart County	Carroll County	Posey County
APH(100%PE) 75%	101 (124)	100 (114)	98 (100)
CRC 75%	102 (137)	101 (124)	98 (100)
GRP(70%MP) 70%	100 (100)	100 (101)	100 (100)
GRP(100%MP)70%	100 (100)	100 (101)	100 (98)

management strategies on average net revenue and downside risk differ among geographical locations. Combinations of strategies involving APH outperformed GRP in Elkhart and Carroll Counties, while the situation was reversed in Posey County.

Our results suggest corn and soybean producers in Indiana should avoid a “do-nothing” strategy because there are multiple risk management strategies that have provided both higher average net revenue and less downside variability in the historic study period. However, producers should consider the specific provisions of crop and revenue insurance products (prevented planting, replant coverage, optional units, etc.) in evaluating risk management strategies in their individual circumstances.

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Table 4. Average net farm revenue and 5% VaR (in parentheses) of selected combination risk management strategies as a percentage of the cash sale at harvest, no insurance strategy in Elkhart, Carroll, and Posey Counties.

Risk Management Strategy	Elkhart County	Carroll County	Posey County
CRC 75%	102 (137)	101 (124)	98 (106)
APH(100%PE) 75%	108 (136)	108 (123)	107 (109)
Futures(M15) 66%	107 (141)	107 (130)	109 (114)
APH(100%PE) 85%	107 (141)	107 (130)	109 (114)
Futures(M15) 66%	106 (113)	108 (113)	110 (109)
GRP(100%MP) 80%	106 (113)	108 (113)	110 (109)
Futures(M15) 66%	106 (113)	108 (113)	110 (109)

Indiana's Egg Industry

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Indiana's significant role in the egg industry is summarized by an egg monument in Mentone, Indiana. This egg monument represents the world's second largest egg*. The commentary on the face of the monument reads "The Egg Basket of the Midwest". Indiana's egg production represents 8% of total table egg production in the U.S. (Indiana Agricultural Statistics Service). In addition to table eggs, Indiana also produces hatching eggs which are incubated to replenish the laying hen stock. Indiana ranks third among egg producing states in number of commercial layers in egg production, behind Iowa and Ohio. In 2004, the number of layers (hens) in Indiana was approximately 22.7 million (Indiana Agricultural Statistics Service) with production of 6.1 billion table eggs a year. Indiana also is home to the second largest egg producing firm in the nation, Rose Acre Farms.

The Indiana egg industry consists mainly of six major egg producing companies, three commercial hatcheries and a spent hen processing facility. Five egg producing companies have more than 1 million layers in production. In 2004 the industry had an estimated production value of \$331 million. It employed 1,687 persons who earned total wages and benefits of \$46 million. There were also 55 farms on contract with the egg producing firms to raise replacement pullets (young laying hens ready to lay eggs) and to produce eggs, earning a total yearly income of \$14.2 million.

Indiana egg producing firms are vertically integrated, i.e. two or more

production stages are owned and coordinated by a single entity. The single entity is also referred to as the "integrator" of all production stages. An egg producing firm typically owns and coordinates all egg production stages including: breeding of laying hen stock, hatching of chicks, feed milling, growing replacement pullets, egg production, processing and further processing of eggs. The firm may also contract some of the egg production with independent farmers. The final products are eggs that may be packaged in cartons or further processed products such as refrigerated liquid eggs or dried egg products. The coordinated arrangement of egg production stages under single ownership has allowed egg producing firms to grow larger, produce more efficiently, and cater more closely to changing consumers' needs and preferences. The purpose of this paper is to describe how the Indiana egg industry operates, to provide consumption patterns at the U.S. level and to provide an outlook on the Indiana egg industry.

From Backyard Hen Production to Vertically Integrated Firms

Commercial egg production in Indiana can be traced back to the early 1920's. Existing Indiana egg company records indicate that by the 1920's several companies had about 1000 laying hens under production, a sizeable quantity at the time. Eggs were also produced for family consumption by ubiquitous backyard hens. Eggs not consumed in the household were then sold to local stores. According to the Census of Agriculture, there were 186,182 egg farms responsible for producing 83 million eggs in Indiana in 1919. Average production per farm was 445 eggs. By 1924, egg production had increased to 1.5 billion eggs, about 4% of national production (Figure 1). Since the 1950's egg operations have tended to grow in size and diminish

in number. By 2002, there were 2,152 farms in the state involved in the production of 6 billion eggs, including table eggs and hatching eggs, with an average production of 2.8 million eggs per farm. However, 93% of the total Indiana table egg production is accounted for by only 6 egg companies. Each of these firms has more than a million layers in production. Some of the top egg producing counties in the state include: Dubois, Jackson, Kosciusko, Newton, Pulaski and Wabash.

There are several factors that have allowed the increase in size of egg producing firms. The first factor is related to technological advances that occurred primarily after World War II (Martinez). These advances include: improved genetics for better rate of egg production, better disease control that allowed a higher concentration of birds, and advances in facilities and machinery that could handle eggs in larger volumes (Rogers; Lasley). The egg industry has also taken advantage of economies of size, i.e. reduction in unitary production costs as production levels increase. Another factor that has allowed egg firms to grow in size is the efficiency gained through the vertical integration of production stages. Under a vertical integration arrangement, the processor typically owns and controls two or more production stages, including: breeder farms, a hatchery, pullet replacement farms, egg producing farms, a feed mill, and the grading, packing and further processing facility. Efficiency occurs in the reduction of transaction costs between production stages and in the coordination of stages to produce the desired quantity and quality of final products (Martinez). Figure 2 includes a diagram of the egg production flow. A description of each stage follows.

Primary Breeders

Primary breeders are responsible for maintaining pure blood lines

* *The Mentone Egg in 1946 was constructed to advertise the local egg festival. This egg is made of concrete, weighs 3,000 pounds, and is 10 feet high. The background of the commentary "The Egg Basket of the Midwest", is a basket of eggs within an outline of Indiana.*

and developing cross-bred blood lines of layers. Each line of birds has different genetic characteristics. To provide an adequate gene pool for future desirable characteristics, several diverse lines of birds need to be maintained. Primary breeders offer any of the first three generations (grandparent, parent, or day-old chicks) for lines of birds used in egg production. Typically day-old chicks are purchased from primary breeders as “parent stock” by the commercial hatcheries and/or egg producing firms. *The “parent stock” for the white-egg layers under production in Indiana is purchased from three primary breeders: Lohmann-Hy-Line International, Hendrix Poultry Breeding and Hubbard-ISA.*

Breeder Farms

“Parent stock” birds are moved to breeder farms. Male and female birds are kept together for the production of fertile eggs from which pullets (fifth generation birds) will hatch. *There are two egg producing firms in the state that have their own breeding farms and hatchery. Indiana is also home to a hatchery owned and managed by one of the three primary breeder firms.*

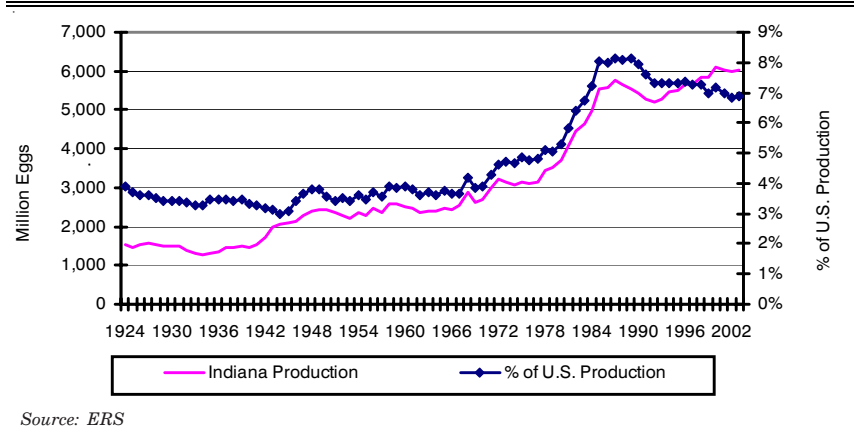
Hatchery

Fertilized eggs obtained from breeder farms are sent to the hatchery. Eggs are placed in large-scale incubators. At the time of hatching, female chicks are vaccinated and prepared for transport to the next stage. *Most Indiana egg firms buy one-day old chicks from commercial hatcheries, primarily from in state hatcheries.*

Pullet Replacement Farms

The day-old female chicks arriving from the hatchery are raised in the pullet replacement farms. In these farms, young hens are kept until they reach the age of egg production. These hens will replace hens that have already outlived their production period. Pullets typically start laying eggs at 18 to 20 weeks of age, but are sent to egg producing farms at 16 weeks of age for acclimation to the new facility. *The larger Indiana egg producing firms have several pullet replacement farms.*

Figure 1. Indiana Total Table Egg Production and Its Share of National Production



Most of the farms are owned by the integrator, yet some are on contract with independent farms.

Feed Mill

A feed mill operation is responsible for the formulation of the different feeds utilized during the distinct stages of egg production. Each feed mill has a grain receiving operation, an ingredient storage area, a mixing system and a pellet-making operation. Corn and soybean meal are the main feed ingredients, with the addition of nutritional supplements such as amino acids, macro and micro minerals. *In 2004 about 24 million bushels of corn and 252,365 tons of soybean meal were used in Indiana*

as feed ingredients for the production of eggs. This is equivalent to 2.5% of corn and soybean meal from 4% of soybeans produced in the state in 2004, although both ingredients may be obtained from adjacent states depending on price and quality.

Egg Producing Complex

A typical egg producing complex may consist of one or several layer houses with a capacity for 100,000 hens. The complex may be of two types: in-line or off-line. An in-line complex refers to an egg collection system that conveys eggs directly from the layer houses into the processing plant. An off-line complex consists of independent layer houses whose production

Figure 2. Egg Production Stages

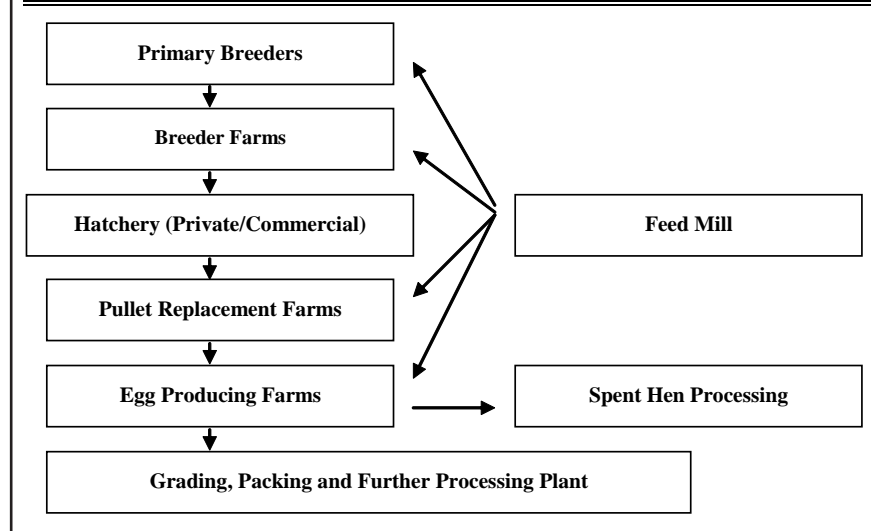
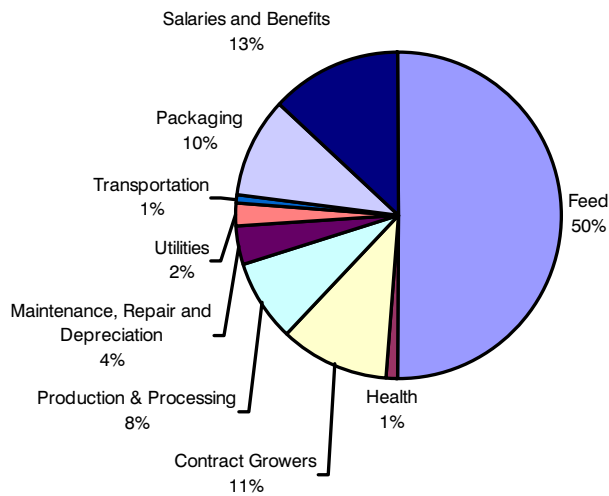


Figure 3. Cost Structure of Indiana's Egg Industry



must be transported to a processing facility. Both types of complexes are used in Indiana. The egg producing complexes are typically owned by the egg producing company, and just a small portion of egg production is contracted to independent farmers.

Processing and Further Processing Plant

This is the final production stage for eggs. Eggs coming from layer houses are cleaned and sanitized, graded, packaged into cartons and refrigerated for transport. Eggs may also undergo a further processing step. For this, eggs are broken, pasteurized and separated into its products: egg whites and egg yolks. These ingredients may be combined with

other ingredients to create a final product. These products can fall into four categories: refrigerated liquid egg products, frozen egg products, dried egg products and non food by-products. The six major Indiana egg producing firms package their own eggs, and three of them are involved in further processing. Examples of further processed products include: pre-packaged hard boiled eggs, sealed plastic bags of ready-to-cook scrambled egg mix with spices, and scrambled egg patties.

Spent Hen Processing Facility

At a spent hen processing facility, hens which are no longer in production are slaughtered and processed. The meat is used as an

ingredient for soups, chicken salad or hot dogs (Scanes et.al.). Indiana has one such facility and it obtains hens from in-state and out-of-state egg producing companies.

Each egg company in the state owns a feed mill, processing facility and egg production complexes (both in-line and off-line). Female chicks which are grown to become the replacement pullets may be hatched by the companies themselves or bought from the commercial hatchery. The firms may also contract with individual farmers for the raising of replacement pullets or production of eggs. Typically the farmer provides housing, equipment, labor and utilities, while the company provides feed, medicine, birds, expert supervision and a pre-established payment for the farmer's services. The state produces table eggs sold in cartons and further processed products including refrigerated liquid yolks, liquid whites, liquid whole eggs, diced eggs, pre-cooked scrambled egg patties, and dried egg products.

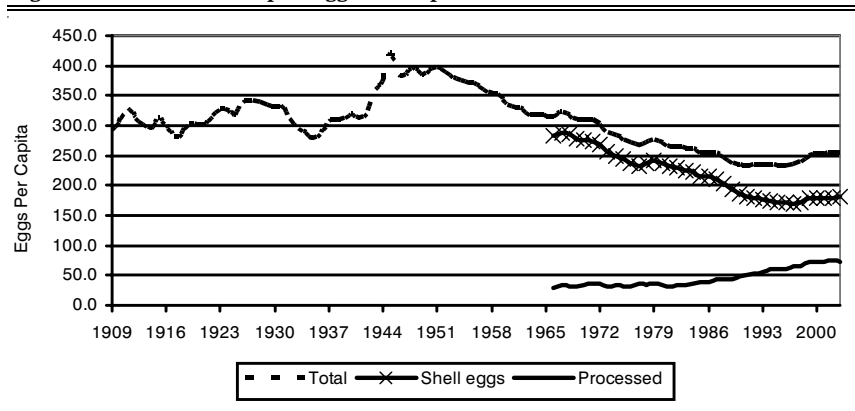
Cost Structure of the Indiana's Egg Industry

Indiana egg production costs are dominated by feed costs (Figure 3). Feed, represents about 50% of the total cost of producing eggs. Payment for labor is the second highest cost item. About 13% is due to salaries and benefits to employees directly related to the companies, and 11% due to payments given to contract farmers. The packaging of eggs representing 10% of total cost is the third highest category. Table eggs are usually packaged in paper or Styrofoam containers, while further processed products require more elaborate packaging. Other production and processing costs represent 8%, followed by maintenance, repair and depreciation of facilities at 4%, utilities at 2%, and bird health and transportation costs representing 1% each of total costs.

Egg Consumption in the U.S.

In 2003 each American consumed approximately 253 eggs. This is 38% less than the all time high of 421 eggs per capita consumed in 1945 (Figure 4). Much of the decline

Figure 4. Historical Per Capita Egg Consumption in the U.S.



in per capita egg consumption is associated with changing eating patterns, fewer home-cooked breakfasts, change in consumer preferences and health concerns about cholesterol in eggs. Per capita consumption declined from the 1945's peak until the 1990's when total egg consumption leveled off, fluctuating between 234 and 244 eggs per capita. For the last five years, consumption of eggs has been rising. This is attributed to a decrease in the real price of eggs. After accounting for inflation, the wholesale price for a dozen of grade A eggs has decreased by 50% since 1983, from 76 cents a dozen to 38 cents a dozen (1983 index year). Consumer attitudes toward eggs have also changed. New research has shown eggs to contain less cholesterol than previously documented (Putnam and Allshouse). There are also new egg products, such as liquid eggs, that emphasize convenience. The consumption of these types of further processed egg products have almost doubled since 1983. The consumption of eggs, especially egg products, is expected to continue to rise as the egg industry responds to consumer demand for more convenient foods.

Outlook for Indiana's Egg Industry

Consumption of eggs and egg products in the U.S. is increasing. Indiana is an important supplier of both table eggs and further processed egg products. Indiana has a competitive position compared to other egg producing states. Indiana egg producers' primary advantage is the availability of low cost feed. Feed represents 50% of the total cost of producing and processing eggs, thus any savings on feed has a relatively large impact on production costs. A second advantage for Indiana producers is market access. Indiana processors are close to major urban areas such as Chicago, Detroit, Louisville, Saint Louis, Indianapolis, and have efficient transportation systems to distribute their products to the densely populated eastern U.S. markets. Increasing fuel prices will mean that Indiana processors' location advantage will become more important as transportation costs become a larger share of total egg production cost. A third advantage Indiana producers have is excess capacity. As the demand for egg products that cater to convenience continues to increase, Indiana

producers are positioned to supply. This competitiveness in feed cost and market access will enable Indiana to continue being the "Egg Basket of the Midwest".

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Domestic Production Activities Deduction

George Patrick, Professor

The American Jobs Creation Act of 2004 provides a new income tax deduction (I.R.C. §199) for taxpayers involved in domestic production activities. This provision is intended to create incentives for greater employment in the U.S. Crops and livestock produced in the U.S. qualify as domestic production activities. The domestic production activities deduction for tax years beginning in 2005 and 2006 is limited to the smallest of:

1. 3% of qualified production activity income (QPAI),
2. 3% of taxable income of a taxable entity or adjusted gross income of an individual taxpayer

(computed without the I.R.C. §199 deduction), or

3. 50% of the FormW-2 wages paid by the taxpayer during the year.

The deduction increases to 6% for tax years beginning in 2007, 2008 and 2009. It further increases to 9% for tax years beginning after 2009. This deduction is computed on Form 8903 and is taken on the front of the Form 1040 as an adjustment to income. Thus, the deduction is for income taxes only and does not reduce earnings from self-employment.

This article explains the concepts, calculations, and terminology involved in determining this new domestic production activities deduction, that is sometimes referred

to as the §199 deduction, in farm situations. The terms are explained and illustrated in situations of a sole proprietor and pass-through entities such as partnerships, S corporations and limited liability companies taxed as partnerships.

Qualified Production Activities Income

Qualified production activities income, commonly referred to as QPAI, is equal to domestic production gross receipts (DPGR) minus the cost of goods sold, other deductions and expenses directly allocable to such receipts, and the share of other deductions and expenses not directly allocable to such receipts. For farmers, the qualifying activities include cultivating soil, raising

livestock, and fishing as well as storage, handling and other processing (other than transportation activities) of agricultural products.

For many farmers, their QPAI will be equal to the sum of net income reported on their Schedule F and net gain from the sale of raised livestock reported on Form 4797. However, there a number of possible exceptions to this as explained below.

Domestic Production Gross Receipts

Domestic production gross receipts (DPGR) are generally the receipts from the sale of qualified production property. For cash basis farmers, this would be the receipts from the sales of livestock, produce, grains, and other products raised by the producer. DPGR includes the full sales price of livestock (like feeder livestock) and other products purchased for resale. Gains from the sale of raised draft, breeding and dairy livestock reported on Form 4797 also appear to qualify as DPGR. Sales proceeds from livestock purchased for draft, breeding or dairy purposes would probably not qualify unless the taxpayer had purchased the animals as young stock and had a significant role in raising them. Gains from the sale of land, machinery and equipment are also excluded from DPGR. Rent received from land is specifically excluded from DPGR. Custom hire income (e.g. combining, spraying, trucking etc.) reported on Schedule F is also excluded from DPGR.

If a taxpayer has less than 5% of their total gross receipts from items which are not DPGR, a safe harbor provision allows a taxpayer to treat all their gross receipts as DPGR. For example, a farmer has income of \$5,000 from planting the neighbor's no-till soybeans. As long as qualifying DPGR exceeds \$95,000, the farmer can include the \$5,000 as part of his or her DPGR. If qualifying DPGR is \$95,000 or less, then \$5,000 custom hire income must be kept separate and expenses allocated between DPGR and non-DPGR activities.

Computing QPAI

To determine QPAI, the farmer's DPGR is reduced by the appropriate costs. If items purchased for resale (like feeder livestock) are included in DPGR, the cost of these items is deducted. Directly allocable and indirectly allocable deductions, expenses or losses related to the items included in DPGR are deducted. For a farmer whose entire crop sales receipts qualify as DPGR, QPAI would be computed by subtracting the allowable expenses and QPAI would be equal to net farm income on Schedule F. If the farmer also had gains from the sale of raised livestock on Form 4797, QPAI would be the sum of net income from Schedule F and the livestock gain from Form 4797.

Calculations are more complicated if total receipts are not all DPGR or do not qualify for the 5% safe harbor discussed above. Cash basis taxpayers and taxpayers with less than \$25,000,000 of gross receipts are allowed to use simplified procedures for allocating costs. For example, assume Ima Producer has \$85,000 of crop sales and \$15,000 of custom work income for total Schedule F receipts of \$100,000. Ima's DPGR would be \$85,000, 85% of total receipts. If Ima's total Schedule F expenses were \$60,000, 85% of the Schedule F deductions, or \$51,000 could be allocated to qualified production activities. Ima's QPAI would be \$34,000, (her \$85,000 DPGR minus the \$51,000 allocated cost).

Computation of the Deduction

The domestic production activities deduction in 2005 and 2006 is computed as the smallest of:

1. 3% of QPAI,
2. 3% of adjusted gross income (AGI), or
3. 50% of Form W-2 wages paid during the year.

For an individual taxpayer, AGI would include other taxable income

and deductible losses. For purposes of the 3% limitation, AGI is computed without the \$199 deduction.

Example 1: Joe Farmer operates as a sole proprietor and has gross farm receipts of \$250,000 from the sale of crops and livestock. All of Joe's receipts qualify as DPGR and he has Schedule F expenses of \$200,000, including \$10,000 of Form W-2 wages for part-time help. Joe has net farm income of \$50,000 on Schedule F and his QPAI is also \$50,000. Assuming Joe's AGI exceeds \$50,000, his domestic production deduction would be the lesser of \$1,500 (3% of \$50,000 QPAI) or \$5,000 (50% of \$10,000 W-2 wages).

For some farm situations, the domestic production activities deduction can be limited by Form W-2 wages.

Example 2: Assume Joe's wife, Mary, provides the part-time help on the farm and is not paid. Income and expenses, other than hired labor, are the same as Example 1. Joe's QPAI would be \$60,000 and Form W-2 wages are \$0. Joe would not qualify for the domestic production deduction.

Note: Joe could reasonably compensate Mary for her work on the farm and qualify for the domestic production deduction. If Joe paid Mary \$8,000, his QPAI would be \$52,000 and he would qualify for a \$1,560 domestic production deduction. Mary's wages would be subject to social security taxes, but Joe's earnings for self-employment tax would be reduced by the amount of the wages paid.

Although there are various ways of computing wages for the domestic production activities deduction limitation, wages for which withholding is not required are always excluded. Thus, wages paid in commodities, wages paid to a child (under the age of 18) of the proprietor (or a child of all of the partners), and compensation paid in nontaxable fringe benefits are not counted in determining the Form W-2 wage limitation.

Pass-Through Entities

S corporations, partnerships and other pass-through entities do not pay income tax, and income and expenses flow through to the shareholders or partners. The §199 limitations are applied at the shareholder, partner or similar level for both QPAI and Form W-2 wage allocation. An individual who has been allocated QPAI from a pass-through entity is also treated as having been allocated Form W-2 wages from that entity in an amount equal to the lesser of:

1. The owner's applicable share of such wages, or
2. Two times 3% (for tax years beginning in 2005 and 2006) of the entity's QPAI allocated to the owner. (The 3% increases to 6% in 2007, 2008 and 2009, and to and 9% for tax years beginning after 2009.)

An individual may be involved in multiple entities. The second limitation restricts an individual who has a negative QPIA and positive Form W-2 wages in one entity from taking a §199 deduction by combining this with another entity with a positive QPAI and little or no W-2 wages. Losses and deductions of pass-through entities may also be limited by the at-risk and passive activity rules. Income and expenses of the pass-through entities involved in qualified production activities are generally combined.

Other Situations

Taxable entities, such as regular corporations, are eligible for the domestic production activities deduction at the entity level, rather than at the owner level. Taxable income of the corporation, before any §199 deduction, would replace AGI in the second limitation on the deduction. Taxpayers who have generally reduced corporate income by making wages and rent payments to shareholders may want to consider leaving more income in the corporation to take advantage of the domestic production activities deduction.

Rent received from land is explicitly excluded from DPGR. Thus, cash rent landowners do not qualify for the domestic production activities deduction. Share-rent landowners could argue that their receipts are from the sale of commodities they produced in a trade or business. Share-rent landowners are considered in the business of farming for soil and water conservation deductions and farm income averaging. However, it could be argued that tax law treats landowners' receipts as rent although they are not reported as rental income on Schedule E. From a practical standpoint, few share-lease landowners will have the Form W-2 wages necessary to meet the wage limitation and thus would not qualify for the domestic production activities deduction.

Cooperatives may be engaged in manufacturing, production,

growth or extraction of agricultural or horticultural products or in the marketing of such products. Cooperatives can allocate the domestic production activities deduction to their patrons. The domestic production activities deduction amount is reported in box 6 of the Form 1099-PATR and the producer would include the amount on line 17 of the Form 8903.

Summary

The new domestic production activities deduction is intended to stimulate employment in the U.S., but does not require taxpayers to increase the amount of labor hired. Many farmers will be eligible for this new deduction, although some may want to make wage payments to their spouse or their children 18 years of age or older to have qualified Form W-2 wages. Cash rent landowners are not eligible for the deduction and share-rent landowners will generally not qualify for the deduction.

The deduction starts out at the smallest of: 1) 3% of qualified production activity income, 2) 3% of adjusted gross income, or 3) 50% of Form W-2 wages paid. However, the limits of the percentage of income increase to 6% in 2007 and to 9% for 2010 and later years. Taxpayers will want to maintain their eligibility for the maximum deduction possible.

Seminars in 2006 to Help with Estate and Farm Business Transfer

Seminars to help farmers, farmland owners and family businesses make plans for the transfer of their property and business interests are scheduled by the Purdue University Cooperative Extension Service in Whitley, DeKalb, Clinton, Tipton, and Clay counties.

Gerry Harrison, Purdue agricultural economist and lawyer, will

present the material and take questions. Gerry has been in the forefront of Purdue Extension Estate and Business Transfer Planning education for over 30 years. He is a professor and teaches Ag Law at Purdue since 1981. In 1983, Gerry initiated a new course, Income Tax Law in the Department of Agricultural Economics.

The seminar will include many of the fundamentals of individual estate planning and business transfer issues. Gerry will review classic methods of "avoiding probate," advance directives, wills, the consequences of being without at will, income, gift and estate tax issues, business organization choices and living trusts.

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Emphasis is on helping both retired farmland owners and farmers understand opportunities for income and transfer tax minimization—how to completely avoid federal estate taxes by following the law and by using charitable transfers, including farmland conservation easements.

Continuing education credits are available for accountants, insurance agents and Indiana lawyers. The 2006 seminar dates, times and locations are:

- January 23 & 24, 6:55 p.m. - 9:35 p.m., DeKalb County, Auburn
- January 24, 8:45 a.m. - 3:15 p.m., Whitley County, Columbia City
- February 24, 8:45 a.m. - 3:15 p.m., Clinton County, Frankfort
- February 27 & 28, 6:55 p.m. - 9:35 p.m., Cass County 4-H Grounds, Logansport
- March 3, 8:45 a.m. - 3:15 p.m., Tipton County, Tipton
- March 7, 8:45 a.m. - 3:15 p.m., Clay County, Brazil
- Cass County, Craig Williams, Phone: 574-753-7750; Fax: 574-753-7759; E-mail: williamsc@purdue.edu
- Clinton County, Curt Emanuel, Phone: 765-659-6389; Fax: 765-659-6382; E-mail: cemanuel@purdue.edu
- Tipton County, Mary Day, Phone: 765-675-2694; Fax: 765-675-3594; E-mail: maryday@purdue.edu
- Clay County, Mark Evans, Phone: 812-448-9041; Fax: 812-448-8309; E-mail: mevans@purdue.edu or
- Gerry Harrison, toll-free at (888) 398-4636 ext. 44216 or 765-494-4216; E-mail: harrisog@purdue.edu

Pre-registration is required with a small fee. Registration is limited at each location. Registration deadlines are four days before each seminar. To get a registration form, contact the Purdue Extension Offices in:

- Whitley County, Valynnnda Slack, Phone: 260-625-3313; Fax: 260-244-6751; E-mail: vslack@purdue.edu
- DeKalb County, Dave Holloway, Phone: 260-925-2562; Fax: 260-925-3130; E-mail: whollowa@purdue.edu

26th Annual Farming Together Workshop January 27-28, 2006

Stewart Center - Purdue Campus

As the family of the farm business looks towards the future of their farming operation, there are many issues to consider. One issue of extreme importance is the development of a son, daughter, or partner to be the future manager of the business. To help you begin development of your management succession plan, the Department of Agricultural Economics at Purdue University will be hosting a Farming Together Workshop on January 27-28, 2006, on the Purdue Campus.

This workshop provides information and work time to develop answers for many issues involved with bringing a new manager into the operation. The workshop provides

an opportunity for you, and your son, daughter, or partner to begin making decisions together about the future of your farming operation.

The workshop will address:

- ways to improve family communication,
- development of a common vision for what will be achieved through the business,
- creation of a management succession plan,
- assessing your farm resources,
- alternative ways to share ownership and management,

- the responsibilities of each member of the business, and
- legal questions that arise when farming together.

This conference is also a wonderful opportunity to spend a weekend with a family member who is attending Purdue.

Additional information about the workshop and registration materials can be found at http://www.agecon.purdue.edu/extension/programs/farm_together.asp or check with your Purdue Extension Office for a registration flier or Purdue Extension toll free at 1-888-398-4636 Ext. 442711 for a flier from Carolyn Hunst.